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To my dear Johnny
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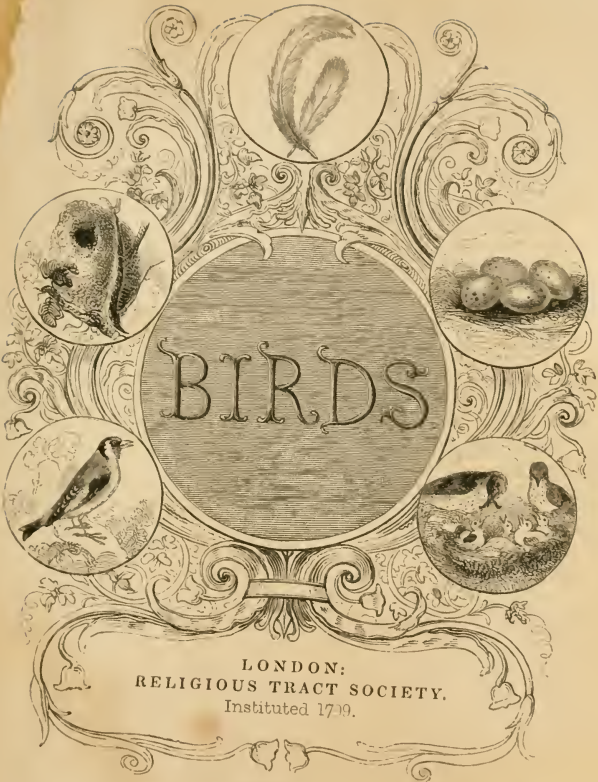
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BIRDS.

LONDON :

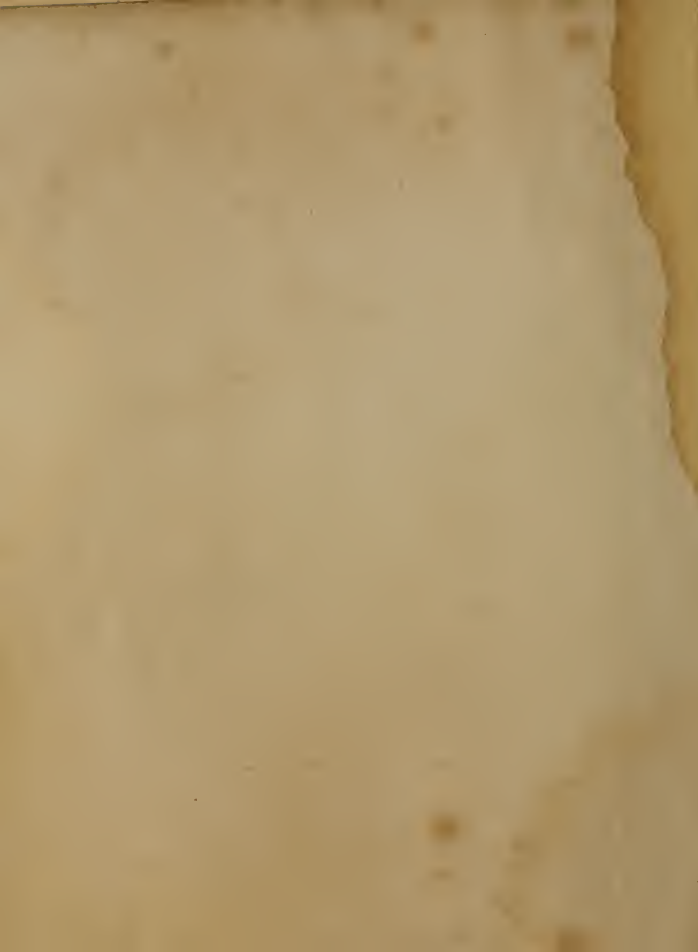
S. & J. Bentley, Wilson, and Fley,
Bangor House, Shoe Lane.



BIRDS

LONDON:
RELIGIOUS TRACT SOCIETY.
Instituted 1799.

MDCCXLII.



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THE NEST.



NEST OF THE ORIOLE.

THE NEST.

CHAPTER I.

ACTIVITY OF SPRING — VARIETY OF NESTS — THE ROBIN — THE PARTRIDGE — THE OSTRICH — THE LARK — THE GOLDEN EAGLE — THE WOOD PIGEON — THE WINDOW-SWALLOW — THE SAND-MARTIN — THE SPARROW — THE WHITE OWL — THE BURROWING OWL — THE THRUSH — THE WOODPECKER — THE WREN — THE GOLDEN-CRESTED WREN — THE RUBY-THROATED HUMMING BIRD — THE RAVEN — THE MAGPIE — THE JAY — THE SWALLOW — THE ROOK.

SPRING is a season of great activity. No sooner have the trees put forth their leaves than millions of birds commence their labours. Here they may be observed bringing long pieces of straw to some hole in an old wall, and there they work in the windows of some lofty buildings. Some may be seen eagerly seizing on small tufts of moss, and others bearing away some fragments of wool which a sheep has left entangled in the thorns. One requires fine roots for its nest, another has cobwebs for the outworks of its abode. He who can now look on without emotion, while God is thus giving such foresight to the thoughtless and strength to the weak, must have a mind in which darkness prevails. Let it

not be so with us ; the God of Providence is here demanding our praises.



The Golden-crested Wren.

Various indeed are the places frequented by birds. The preferences of some of them have thus been stated by one of our poets :—

The partridge loves the fruitful fells ;
The plover loves the mountains ;
The woodcock haunts the lonely dells ;
The soaring heron the fountains.
Through lofty groves the ring-dove roves,
The path of men to shun it ;
The hazel-bush o'erhangs the thrush,
The spreading thorn the linnet.

Thus, every kind their pleasure find,
The savage and the tender :
Some social join, and leagues combine ;
Some solitary wander.

The materials used by birds in forming their nests are also various. The same places and articles are rarely, perhaps never, found united by the different species, though we should suppose similar necessities would direct to an uniform provision. Birds that build early in the spring, seem to require warmth and shelter for their young. Thus the blackbird, in common with others, lines its nest with a plaster of loam, which completely excludes the keen icy gales of the opening year.

We commonly think that a nest should be so formed that the eggs may not roll out ; yet many species nestle on the ground, without either finding or making any hollows. The robin usually selects a shallow cavity among grass or moss in a bank, or at the root of a tree.

Humble is his home,
And well concealed ; sometimes within the sound
Of heartsome millclack, where the spacious door,
White dusted, tells how plenty reigns around ;
Close at the root of brier-bush, that o'erhangs
The narrow stream, with shealings bedded white,
He fixes his abode, and lives at will.

In like manner, the partridge makes no nest, but scrapes a small hollow in the ground, placing a few fibres therein to deposit its eggs on.

Burchall, the traveller, speaks of an ostrich's nest which he observed in South Africa, as a bare concavity scratched in the sand. It was six feet in diameter, surrounded by a shallow trench, and without the smallest trace of any materials, such as grass, leaves, or sticks, to give it a resemblance to many other nests.

As we think of other birds, we are reminded that

The lark too, asks
A lonely dwelling, hid beneath a turf,
Or hollow, trodden by the sinking hoof :
Songster of heaven ! who to the sun such lays
Pours forth, as earth ne'er owns.

The structure, if so it may be called, of the golden eagle is quite flat, without any perceptible hollow, and commonly set between two rocks, in a dry inaccessible place. It is constructed nearly like a floor with great sticks, five or six feet long, supported at the ends, and crossed with pliant branches. It has no covering above, and the same nest serves for a whole generation.

The nest of the wood pigeon is composed of the rudest materials. These are only a few loose sticks, but the dwelling is admirably adapted for concealment. "How often," says Mr. Jesse, "have I observed the strong, rapid flight of a wood pigeon from a tree, and heard the noise produced by his wings, and then looked

up into the tree expecting to see his nest, without being able to perceive it. This has been owing to the various deposits of dead leaves and small branches which have been accumulated in various parts of the tree, and which have exactly the same appearance which the nest of the wood pigeon has."

When the window-swallow begins to provide a suitable dwelling for its family, the crust, or shell of its nest seems to be formed of such dirt or loam as is nearest at hand. This is tempered and wrought together with small pieces of broken straw, to render it tough and tenacious; and, as the bird often builds against a perpendicular wall without any projecting ledge under, its utmost efforts are needed to secure a firm foundation. To effect its purpose, the swallow not only clings with its claws, but partly supports itself by strongly inclining its tail against the wall, and thus steadied, it works and plasters the materials into the face of the brick or stone. But then, that this work may not, while it is soft and fresh, be pulled down by its own weight, the bird does not proceed too fast. Building only in the morning, there is time enough for it to dry and harden. About half an inch seems a sufficient layer for a day; yet in about ten or twelve days a nest is formed, strong, compact, and warm, with

a small opening towards the top, and fully adapted to the purposes intended.

The outer part of the nest is full of knobs ; nor is the inside smoothed with any exactness, but it is made soft and warm by a lining of small straws, grasses, and feathers, or by a bedding of moss and wool. Sometimes these birds begin many dwellings, and leave them unfinished ; but when once a nest is built in a sheltered place after much labour, it serves for several seasons.

The sand martin mines deep holes in sand or chalk cliffs, to the depth of two or more feet, at the end of which it forms a loose nest of fine grass and feathers, put together with but little art. With what does this little bird make its chamber ? Merely with its beak, a sharp awl, which is very hard, and tapers suddenly from a broad base to a point. With this tool it works, picking away from the centre to the circumference of the opening, which is nearly circular, and working round and round as it proceeds, the gallery being more or less curved in its course, and being narrow and funnel-shaped at the end. One observer watched a swallow cling with its sharp claws to the face of a sand bank, and peg in its bill as a miner would his pick-axe, till it had loosened a considerable portion of the sand and tumbled it down amongst the rubbish below.



Sand Martins and their Nests.

Another swallow often chooses the chimney of an old farm-house, while the martin occupies the eaves. Here, too, sparrows find a crevice; sometimes they choose the roof of a house, or, if the latter be of thatch, they scoop out a hole for their nests of hay and straw, lined with feathers. Failing here,

Within the hedge
The sparrow lays her sky-stained eggs.

Nor will these birds disdain to fix their abode in some tree. They like to build too under the mud-bottom of a rook's nest, which defends them from the rain.

The white owl seeks the antique ruined wall,
Fearless of rapine; or, in hollow trees,
Which age has caverned, safely courts repose.

A different course is taken by the burrowing owl of America. It resides only in the villages of the mar-mot or prairie dog, where excavations are so commodious as to render it unnecessary that this bird should build for itself, as it is said to do in other parts of the world, where burrowing animals do not exist. These villages, which are numerous, vary in extent, sometimes covering a few acres, and at others spreading over the surface of the country for miles. They are composed of mounds, about two feet in width at the base, and seldom rising eighteen inches above the surface of the soil.

The entrance is placed at the top, or on the side ; from this the passage descends vertically for one or two feet, and from thence is continued obliquely downwards. It ends in an apartment, within which the marmot constructs, on the approach of the cold season, a comfortable cell for its winter's sleep. It is composed of fine dry grass, in a globular form, and has an opening at the top, capable of admitting a finger. The whole is so compact that it might be rolled on the floor without injury. The burrows into which the owls have been seen to descend, on the plains of the river Platte, where they are most numerous, were evidently made by the marmot : and it is supposed that the owl was the sole occupant of a burrow by right of conquest.

The following description of the thrush is beautiful :—

Within a thick and spreading hawthorn bush,
That overhung a mole-hill large and round,
I heard from morn to morn a merry thrush
Sing hymns to sunrise, while I drank the sound
With joy : and, often an intruding guest,
I watched her secret toils from day to day,—
How true she warp'd the moss to form her nest,
And modell'd it within with wood and clay.
And by and bye, like heath-bells girt with dew,
There lay her shining eggs as bright as flowers ;
Ink-spotted-over shells of green and blue ;
And there I witness'd, in the summer hours,
A brood of nature's minstrels chirp and fly,
Glad as the sunshine and the laughing sky.

The woodpecker chooses an apple, pear, or cherry tree. This is minutely examined for several days before; and the work is first begun by the male, who cuts out a hole in the solid wood, as circular as if described with a pair of compasses. Occasionally, he is relieved by the female, both of them working with the greatest diligence. The hole, if made in the body of the tree, is generally downwards at an angle for six or eight inches, and then straight down for ten or twelve more. It is roomy, capacious, and as smooth as if polished by the cabinet-maker; but the entrance is only large enough to admit the body of the owner. During this toil, the birds regularly carry out the chips, often strewing them at a distance to prevent suspicion. The labour sometimes occupies the chief part of a week. The female, before she begins to lay, often visits the place, examines every part both without and within, with great care, and at length takes possession.

The cavern-loving wren, sequestered, seeks
The verdant shelter of the hollow stump,
And with congenial moss,—harmless *déceit*,—
Constructs a safe abode.

So cautious is this bird, that it leaves only a small side-entrance into the place it selects; and if the nest be touched, the bird will rarely enter it again. In forming her dwelling, the wren does not begin with the bottom,

as most birds do, but first, as it were, traces the outline, if against a tree, and fastens the nest with equal strength to all parts. It afterwards encloses the sides and top, leaving only a small hole near the latter for entrance. If the nest is placed under a bank, the top is first begun, and well secured in some small cavity, by which the fabric is suspended.

The reason for this dwelling being of a globular form is plain. The young would be too much exposed in an open nest, and the little bird, issuing from an egg of only twenty grains in weight, may be supposed to require defence from the weather. Hence, the chief bulk is from the thickness of the walls. It is remarkable too, that the advantages of this nest are not limited to the period of the parent bird's care. The young birds, long after they can fly and provide for themselves, return to it at night, and sleep under the parental roof.

Mr. Knapp, in one of his Notes of a Naturalist, says : " I was much pleased to-day, by detecting the stratagems of a common wren to conceal its nest from observation. It had formed a hollow space in the thatch, on the inside of my cow-shed, in which it had placed its nest by the side of a rafter, and finished it with its usual neatness ; but, lest the orifice of its cell should engage attention, it had negligently hung a ragged piece

of moss on the straw-work, concealing the entrance, and apparently proceeding from the rafter ; and, so perfect was the deception, that I should not have noticed it, though tolerably observant of such things, had not the bird betrayed her secret, and darted out."

The nest of the golden-crested wren is remarkable for its neat and compact structure. Usually suspended at the end of the sweeping branch of a larch or pine, attached to the under side of the foliage, and fastened skilfully to the twigs, it is covered by the leaves which form a sort of pent-house to defend it from the



Nest of the Golden-crested Wren.

rain. Moss, the webs of spiders, lichens, and other materials, are employed to make a thick and well-compacted mass; and within are downy feathers, that it may be exquisitely warm and soft.

What a work of assiduity and toil is this ! The architects are but three inches and three quarters in length, while the circumference of the nest is eleven inches.

The nest of the ruby-throated humming bird of Pennsylvania, as described by Wilson, is generally fixed on the upper side of a horizontal branch, not among the twigs, but on the body of the branch itself. Some instances are mentioned in which it was attached by the side to an old moss-grown trunk ; and others, in which it was fastened on a strong rank stalk, or weed, in the garden : but such cases are rare. This bird often chooses in the woods a white oak sapling to build on, and in the orchard or garden selects a pear tree for that purpose. The branch is seldom more than ten feet from the ground. The nest is about an inch in diameter, and about as much in depth.

The outer coat of a very complete one was formed of small pieces of a species of bluish-grey lichen, that grows on old trees and fences. These are thickly glued on by the saliva of the bird, giving consistency and firmness to the whole, and keeping out the moisture. Within were thick matted layers of the fine wings of certain flying seeds, closely laid together ; the downy substance of the green mullien and of the stalks of the common fern, lines the whole. The base of the

nest was continued round the stem of the branch, to which it closely adheres ; and when seen from below, appeared merely as a mossy knot, or accidental swelling.

On topmost boughs
The glossy raven, and the hoarse-voiced crow,
Rocked by the storm, erect their airy nests.
The ouzel, lone frequenter of the grove
Of fragrant pines, in solemn depth of shade
Finds rest ; or, 'mid the holly's shining leaves.

Attachment to a nest is sometimes very strong. In the centre of a grove, there stood an oak, on which a pair of ravens fixed their residence for such a series of years, that it was called the raven tree. Many attempts were made by youths in the neighbourhood to reach this nest, but the tree, though on the whole stately and tall, bulged out greatly about the middle of the stem ; and this was such an obstacle that the most daring of them gave up the effort. The ravens, therefore, built on, nest after nest, in security, till the very day in which the wood was to be levelled. It was in the month of February, when these birds usually sit. The saw was applied to the butt, the wedges were inserted in the opening, the woods echoed to the heavy blows of the beetle, the tree nodded to its fall, but still the bird sat on. At last, when it gave way, the bird was flung from her nest, and was whipped down by the twigs, which brought her dead to the ground.

In passing to other birds, we are reminded that

The thievish pie, in two-fold colours clad,
Roofs o'er her curious nest with fern-wreathed twigs,
And side-long forms her curious door ; she dreads
The taloned kite, or pouncing hawk ; savage
Herself,—with craft suspicion ever dwells.

The jay constructs its nest very slightly. Its eggs may be observed through the loosely blended materials. The reason is, they are exposed to no peculiar danger, and the warmth needed in other cases, is obviously not required in theirs. Variety is, however, continually apparent. Thus, the greenfinch places its rudely-formed nest in a hedge, little caring for concealment ; while the chaffinch, in the elm just above, hides its neatly-formed abode with the utmost care.

Mr. Jesse, calling at the house of a gentleman in Warwickshire, was surprised on seeing a swallow's nest built on the knocker of the hall-door, and the parent bird actually sitting on the eggs. When the door was opened, as it frequently was during the day, the bird left her nest for an instant, but returned to it as soon as the door was shut. He afterwards learned that the swallow hatched her eggs, and that the young arrived at maturity.

It has been observed, that those birds which are

necessarily long absent from their nests, in search of food, make much warmer dwellings than those which can procure it more readily. Of this the same writer furnishes the following instance. As the long-tailed titmouse has from twelve to fifteen young ones to provide for, and must travel far in search of food, she not only lines her nest with a profusion of the choicest down and feathers, but makes it almost in the shape of a ball, with a small hole in the side to enter at, so that the young are effectually defended from cold in their snug dwelling.

A nest of one of these birds was found by Mr. Jesse with a feather placed over the opening, evidently intended to defend it from the cold winds that prevailed at the time. It formed a sort of valve, and was pushed in or out as the birds entered the nest or left it. In different circumstances, we discover no such protection. The thrush can readily procure worms in a lawn or in a meadow ; it therefore lines its nest with clay or cow-dung. The hen of the rook seldom leaves her nest, and is fed during the time she sits on her eggs by her mate ; and the dwelling has but little warmth of lining in it, though placed in an exposed situation.

How beautiful are all these provisions ! To what are they to be traced ? Many would answer, " Instinct ;"

and there they would stop. But let us not do so ; for instinct is a gift of God, and shows most impressively His care for creatures whom men often despise. While, then, it becomes us to guard against all unkindness towards them, we should adore that wisdom and goodness which they so constantly manifest. "Let everything that hath breath praise the Lord," *Psa. cl. 6.*

We are taught no less certainly, a lesson of humility. As we look on one of the little fabrics already described, we may well exclaim with *Hurdis* :—

It wins my admiration
To view the structure of that little work—
A bird's nest. Mark it well, within, without :—
No art had he that wrought ; no knife to cut,
No nail to fix, no bodkin to insert,
No glue to join : his little beak was all ;
And yet how neatly finished ! What nice hand,
With every complement and means of art,
And twenty years' apprenticeship to boot,
Could make me such another ? Fondly, then,
We boast of excellence, whose noblest skill
Instinctive genius shames.

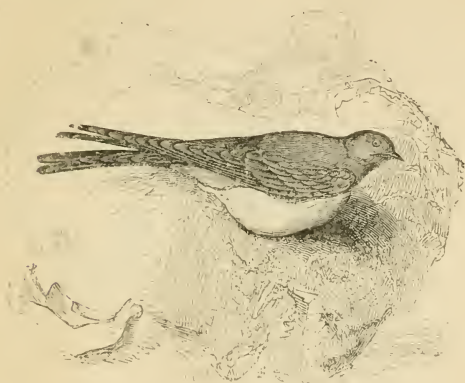
But the subject is far from being exhausted ; other remarkable instances of ingenuity among the feathered tribes will be given in the following chapter.

CHAPTER II.

NEST OF THE ESCULENT SWALLOW—THE TAILOR BIRD—THE GREAT SEDGE WARBLER—THE FANTAIL WARBLER—THE REED WREN—THE PHILIPPINE WEAVER BIRD—THE BOTTLE-NESTED SPARROW—THE SOCIABLE GROSBEEK—THE CAPOCIER—THE ORIOLES.

THE nest of the esculent swallow must be noticed, not only because it is curious in itself, but because it is one of the greatest luxuries of the Chinese, and actually becomes an important article of commerce in the Indian Archipelago. Sir George Staunton found, in a small island near Sumatra, several of these fabrics, placed in two caverns running horizontally into the side of the rock. They seemed to be composed of fine fibres, cemented together by a transparent, glutinous matter, not unlike what is left on stones by the foam of the sea when carried by the tide. The nests adhered to each other and to the sides of the cavern, mostly in horizontal rows, without any break, and at different depths, from fifty to five hundred feet. Their value

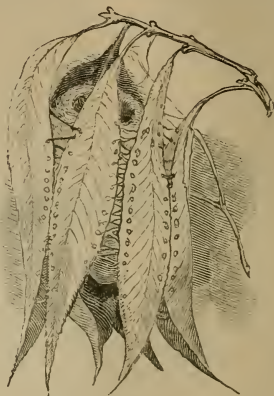
is chiefly dependent on the uniform firmness and delicacy of the texture ; those that are white and transparent being most esteemed.



The Esculent Swallow in its Nest.

A native of India and Ceylon, the little tailor bird, measuring only three inches and a half long, and weighing about ninety grains, makes a nest, which all who see or hear of it must admire. As snakes and monkeys are formidable foes to the feathered tribes, (and they abound in the country of the tailor bird,) it makes a cradle of a leaf at the end of some pendant twig. If a

single leaf be sufficiently large, it draws the edges together, thus forming a pouch, the end of which is made to assist in supporting the nest within. If one leaf be not large enough, another is sewn to it, and perhaps another, so that there may be a proper place for the nest. This is composed of down, mingled with fibres and a few feathers.



Nest of the Tailor Bird.

The great sedge warbler is not wanting in skill for its domestic fabric. Though not seen in this country, it is abundant in Holland, and it also finds a home in the marshy grounds near Calais. Its nest is found among the stalks of growing reeds, admirably interlaced with fibres and grass, so as to form a secure support.

Another beautiful structure is made by the fantail warbler. It is placed in a tuft of tall grass, and raised above the ground. A number of the blades of grass are drawn together and sewed with a kind of cotton thread,



Nest of the Fantail Warbler.

which the bird manufactures. Thus secured, they form an outer case to a long and barrel-shaped nest, open at the top. It consists of a cotton-like material, fastened by threads to the blades and stalks, which surround it so closely that nothing can be more completely concealed. How the thread is formed, and how the sewing is done, we cannot tell. Truly "the God of nature is the secret guide."

The reed wren also builds a pretty nest, wherever marshes, fens, and sluggish waters yield abundantly its food and shelter, in reeds and tall grasses.

The Philippine weaver bird skilfully weaves a nest, in the shape of an inverted flask: the entrance is at the end of a prolonged neck, through which is the passage to a snug little chamber in the round body of this singular dwelling. It may sometimes be seen suspended over wells.

The engraving (p. 26) is taken from the nest of an African species of this genus. It is fixed to the slender leaves of some kind of palm, and is remarkably firm and beautiful. It consists of the long tough stalks of one of the grasses, interwoven with admirable exactness and nicety. Who that dwells on the various stages of the work, from the twining of the first fibre round the leaf, to the completion of long and depending passages, will not be



Nest of the Reed Wren.

struck with the difficulties surmounted? Colonies of these birds have been observed, several hundreds of these pen-



The Weaver Bird and Nest.

dant nests appearing on a single tree. This is chosen from its hanging over the bank of a river or precipice.

Another bird remarkable for its pendant nest, is the

baya, or bottle-nested sparrow. It is found in most parts of Hindostan, associating in large communities, and covering extensive clumps of date-trees, acacias, and palmyras with their nests. These are very ingeniously formed by long grass, woven together in the shape of a bottle, and suspended to the extremity of a flexible branch, as a defence from many foes. The arrangements of these nests are still more singular. They contain several apartments adapted to different purposes. In one the hen broods over her eggs; in another, consisting of a little thatched roof and covering a perch, is her mate, who cheers his companion with his chirping note.

The most singular assemblage of nests hitherto known is that of the sociable grosbeak, or weaver bird of South Africa. Le Vaillant sent a wagon to fetch one, that he might open the hive, and examine the structure in its minutest parts. On cutting it to pieces with a hatchet, it was found to consist of a mass of grass, without any mixture, so compact and firmly basketted together as to keep out the rain. With this, which is to serve as a canopy, the structure begins; it has a projecting rim, and being a little inclined, it serves to let the rain-water run off. Beneath this roof each bird builds its nest, which is three or four inches in diame-



Nest of the Sociable Grosbeak.

ter ; but, as all are in contact around the eaves, they appear to form but one building. The nests are only distinguishable by a little outer opening, which serves as an entrance, and even this is sometimes common to three different nests, one of which is placed at the bottom and the other two at the sides. It is said, that as the number of cells increase with the inhabitants, the old ones become streets of communication. The largest examined by Le Vaillant contained three hundred and twenty inhabited cells.

Wilson, the celebrated American naturalist, observed with much interest the movements of a bird he calls the capocier. The place chosen by a pair of these for their cradle was a corner of a retired and neglected garden, by the side of a small spring, and beneath the shelter of the only tree growing in that retreat. At first, they laid in this shrub a part of the foundation of their abode with moss, the fork of the branches chosen to receive their nest being already bedded therewith. The second day's labour presented a rude mass, about four inches thick and from five to six inches in diameter. This was the basis of their fabric, composed of moss and flax, interwoven with grass and tufts of cotton.

On the seventh day, their task was finished. The fabric was as white as snow, nine inches high on the

outside, but within not more than five. Its outer form was very irregular, because of the branches which the birds had found it necessary to enclose, but the inside exactly resembled a pullet's egg, placed with the small end downward. Its greatest diameter was five inches, and the smallest four. The entrance was two-thirds or more of the whole height, as seen on the outside; but within it almost reached the arch of the ceiling above.

The interior of the nest was so neatly felted together, that it might have been taken for a piece of fine cloth, a little worn; the substance was so compact and close, that it would have been impossible to detach a particle of the materials without tearing the texture to pieces.

Nearly all the orioles belong to America; and their nests deserve notice. The Baltimore, however, has one remarkable for its superior convenience, warmth, and security. For these purposes, it generally fixes on the high bending extremities of the branches of trees, fastening strong strings of hemp or flax round two forked twigs, corresponding with the intended width of the nest. With the same materials, mixed with loose tow, it makes a strong or firm kind of cloth, in fact, a felt-like substance. This is formed into a pouch of six or seven inches deep, which is lined with various soft substances, well interwoven with the outward netting, and

finished with a layer of horse-hair. The whole is shaded from the sun and rain by a canopy of leaves.

It is a curious fact, that there is a great difference in the style and finish of these nests. One of the neatest among many observed by Wilson, the naturalist, was in the form of a cylinder, five inches in diameter, seven deep, and rounded at the bottom. The opening at top was narrowed, by a horizontal covering, to two inches and a half in diameter. The materials, flax, hemp, tow, hair, and wool, were woven into a complete cloth, the whole being tightly sewed through and through with long horse-hairs, several of which measured two feet in length. The bottom was composed of thick tufts of cow-hair, sewed also with strong horse-hair. This nest was hung on the end of the horizontal branch of an apple-tree, and though shaded by the sun, was visible a hundred yards off.

Another variety of this species, the orchard oriole, often attaches its dwelling to the pendant branches of the weeping willows. As they are often of great length, the nest, which is made of the materials just mentioned, is much deeper, to prevent the eggs or the young being thrown out.

We might proceed with other remarkable instances of nest-building, but the space allotted to this interesting

subject is now occupied, and it only remains to offer a few observations. A Christian mind will not have failed before this to recall the fact, that the provision made for the feathered tribes was denied to the Lord Jesus Christ, when he tabernacled with men on the earth. What was his declaration to one who proposed to follow him whithersoever he went? "The foxes have holes, and the birds of the air have nests; but the Son of man hath not where to lay his head." How deep was his humiliation! How wondrous his love to man!

And why did Jesus thus appear as "a man of sorrows?" It was, to "put away sin by the sacrifice of himself," Heb. ix. 26. Let us, then, keep this truth constantly in view. *Our* iniquities can only be forgiven through his precious blood. In Him, therefore, may I trust, and in Him alone; for through Him all that believe shall be freely and fully justified in the sight of that God against whom they have grievously transgressed. "Accepted in the Beloved," we shall be changed into His image, "from glory to glory, even as by the Spirit of the Lord." And, to be made holy, is to be made happy for ever.

THE EGG.



EGGS OF THE BUNTING.



THE EGG.

CHAPTER I.

THE GOD OF PROVIDENCE — WONDERS OF HIS ORDINARY
OPERATIONS—STRUCTURE OF AN EGG.

A DEEPLY interesting circumstance is related in the life of Brentius, the chief reformer of Würtemberg. Compelled to flee from the rage of persecution, he entered the first house he found open, went unobserved up stairs to the part under the roof, and creeping on his hands and knees between it and a pile of fagots, sought in one corner a refuge from his enemies. To this place, however, he was pursued; and his feelings must have been indescribable, when he heard their spears thrust through the wood-pile that concealed him, and had even to shrink aside from one of the thrusts.

In this situation he continued for fourteen days ;

and during this time was sustained by very extraordinary means. On the first day he was there, a hen came at noon to a spot near his feet, laid an egg, and then went away quietly, without the peculiar cry made by such a bird, and which, in this case, might have proved fatal to Brentius. This faithful sufferer for the truth's sake, received the egg as from the hand of God, and ate it with a piece of the single loaf he had brought with him. To the same spot the hen resorted daily, and laid her egg while Brentius remained in this place: and it is equally remarkable, that the day in which the Spanish soldiers, who were ordered by the Duke of Würtemberg to take him dead or alive, left the town, she did not come.

This fact is one among many, exhibiting the interposition of the God of providence in behalf of his faithful servants. To him they are constantly indebted; but, when they are in the path of duty, and circumstances of peculiar difficulty or danger arise, they are warranted to expect special supplies. Most encouraging are the words of our Lord and Saviour: "Are not two sparrows sold for a farthing? and one of them shall not fall on the ground without your Father. But the very hairs of your head are all numbered. Fear ye not therefore, ye are of more value than many sparrows," Matt. x. 29, 30, 31.

How important is it, then, that every reader should inquire, "May I address God as *my* Father? Am I, though once at enmity, reconciled to him through the death of his only-begotten and well-beloved Son?" And if the only faithful answer is, "I am not," let it be rejoined, "I will cast myself on his mercy, which is revealed through the blood of the cross; for 'he that believeth not is condemned already,' while 'there is no condemnation to them which are in Christ Jesus.'"

If the special interposition of God in behalf of his people demand our serious and grateful consideration, there is also much to require, and also to repay, attention, in the ordinary movements of his providence, and in all his works. Let it be supposed, for a moment, that our previous knowledge of the facts were entirely effaced, and that after being shown an egg, we were told, that it was only for it to be exposed to a certain degree of heat, during so many days, and there would issue forth a creature belonging to a class of

Birds, the free tenants of land, air, and ocean ;
Their forms all symmetry, their motions grace ;
In plumage delicate and beautiful—

how great would be our surprise and admiration at such a statement as this ! With what interest should

we glance at the little oval body, and then at a bird like that of which we have here a representation !



The Hoopoe.

Similar feelings should now be indulged. It is probable that the facts about to be stated will be as novel as they are marvellous to the generality of readers, while others may be glad to have them in a form in which they have not before appeared.

Let us, then, look first at the egg-organ of a bird.



The Egg-organ, with the
Egg-tube.

It contains all the eggs which are to be laid for several years, each one differing from the rest in composition, colour, and size. Those which are to be first laid are the largest, and of a yellowish hue; the others are gradually less in size and lighter in colour. The egg first appears as a small yellow globe, but its size increases till it drops from its slender fastening, and falls into the egg-tube. Before it does so, it has neither

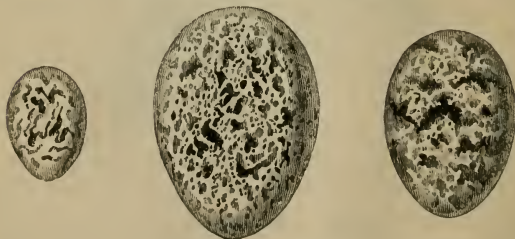
white nor shell; and without the latter, eggs are sometimes laid by a bird, from ill health or accident.

On falling into the tube, the egg has only a single and very thin membrane for a covering, but soon after it has another, which is a little thicker. This is produced by the egg exciting the vessels lining the tube to throw out a substance, which forms this second coating, jutting out into small knobs at each end. As the

egg passes along, it is also thickly covered with the white which fills the tube ; and proceeding onwards, it obtains a third coating, which is the first layer of the membrane of the shell. Over this the second layer is formed, and as the egg proceeds through the remainder of the tube, the shell is completed.

The growth of an egg is exceedingly rapid ; and particularly is this the case with the white and the shell. An extraordinary exertion of nature appears required for this result. A few hours only pass in forming the shell. Yet, how wondrous is the process which has thus far been traced !

The eggs of birds are sometimes not easily identified,



Egg of the Reed Bunting. Egg of the Ptarmigan. Egg of the Black Tern.

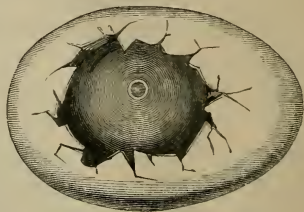
from their varying so much ; the colourings and markings differing greatly in the same species, and even in the

same nest. Those of one colour retain it, with only shades of variation ; but blotches or spots are often very dissimilar, occasioned sometimes, perhaps, by the age of the bird. It should, however, be added, that though the marks are so variable, the shadings and spottings of one species never wander so as to become exactly figured like those of another family, but preserve a certain kind of figuring from year to year. The eggs of the house-sparrow are the most variable of all.

Colour, in various circumstances, has frequently excited much curiosity, without gratifying it ; and this is the case with the colour of eggs. The eggs of the barn-door fowl are white ; those of the nightingale of an olive-brown ; and other great differences might be easily mentioned. It is probable, however, that as there are glands which secrete the general ground colour of a shell, so there are others among these which supply the additional colouring matter. That the one may remain, while the other is removed, has been proved by various experiments. The egg of a song thrush, for example, has a bright blue ground colour, with irregular spots and blotches of black ; but the latter have been preserved from the action of acid, which has entirely dissolved the former : and this is only one instance of many that might be given.

The egg of a bird is beautifully adapted to the process it has to undergo. Its oval form permits a greater part of its surface to be in contact with the warm skin of the parent than if it had been like a globe. The shell, too, being of a hard texture, and arched in form about the soft contents, sufficiently defends them from the pressure they have to bear. As warmth, moreover, is all which the egg derives from the parent, the shell is porous for the entrance of air.

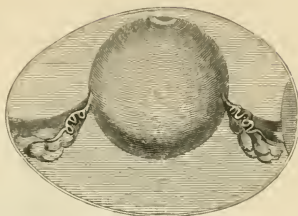
Other arrangements equally deserve attention. In an egg ready for the process of hatching, a small spot may be observed on the yolk: when examined, it is apparently a vesicle, or bag, containing a fluid matter.



Egg showing the Embryo.

In this swims the embryo of the future bird; and, as it is necessary that it should be close to the breast of the hen, and not at the cold bottom of the nest, provision is made for this in a most admirable manner. The yolk is, in fact, a globe, and the little vesicle containing the embryo, involved in the surrounding membrane, is, consequently, at the surface of this ball.

Now, were its axis through the centre, it would not move with the change in the position of the egg. But the axis being below the centre, it must turn round with every such change, whether the globe be heavier or lighter than the surrounding white. Were it heavier, the embryo would fall to the lower part of the shell, but it is lighter, and therefore rises to the upper part of the shell.



Suspension of the Yolk and Embryo
in the Egg.

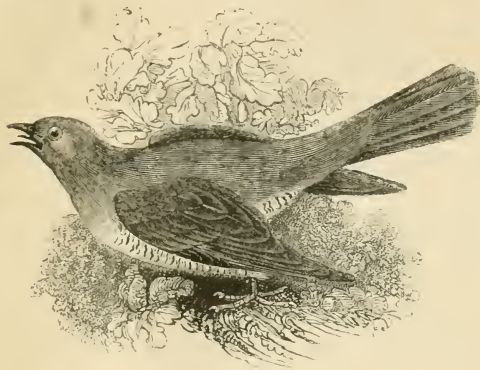
There is a well-known story of Columbus, of which we may here be reminded. After his discovery of America, there were many who said, that any one could have done what he did; thus, in a very unkind spirit, attempting to deprive him of the honour he had fairly won. He, therefore, assembled them together, and asked if they could make an egg stand upright on a looking-glass, held horizontally. They tried, and repeatedly failed; and, on giving up the experiment, he shook the egg, and thus, to their discomforture, the thing was done, and a pungent and well-deserved reproof administered.

The same part of the yolk being always uppermost, an egg cannot be balanced on its larger end while the membranes within remain unbroken, though this may be easily done if the membranes be ruptured by shaking the egg.

The structure of the egg, as apparent in the last engraving, deserves minute attention. Two dense, tough cords appear, each of them being strongly attached to the yolk-bag. They then pass through the white, and are connected with the inner lining membrane at each end of the egg. These cords contain, as represented, a spiral filament. There are thus two fixed points on which the yolk can rotate; and the spiral filament, surrounded by thickened albumen, is, by its greater weight, always inclined to the lowest point. Nor is this all; for the elasticity of these cords is so nicely adapted to the force by which the yolk is borne up, as to restrain it at a given point, and allow sufficient space between the yolk and the inner lining of the shell for the white to lubricate the surface of the yoke, and thus defend the embryo from injury.

There are instances, in which the bird evades the trouble of hatching its young. Thus the European species of the cuckoo, by a wonderful instinct, lays its egg in the nests of soft-billed, insect-eating birds,

such as hedge-sparrows, red-breasts, and tit-larks, to whom it can entrust the proper care of its young. The corn-bunting of America resembles, in some respects, the cuckoo of our regions. Dr. Potter, seeing



The Cuckoo.

a hen-bird prying into a bunch of bushes in search of a nest, he determined, if possible, to watch the result. Knowing how easily she would be disturbed by any one approaching, he mounted his horse, and proceeded slowly, sometimes seeing, and at others losing sight of her, till he had travelled nearly two miles along the margin of a creek. She entered every thick

place, prying most minutely wherever the small birds usually build, and at last darted suddenly into a thick copse of alders and briars, where she remained for five or six minutes, and then returning, soared above the underwood, and returned to the company she had left feeding in the field.

On entering the covert, Dr. Potter found the nest of a yellow-throat, with an egg of each. This bird returned to the nest while he waited near the spot; but, after darting in, she quitted it immediately, perched on a bough near the place, remained a minute or two, and entering it again, returned and disappeared. In ten minutes she appeared once more, accompanied by the male. They chattered, in great agitation for half an hour, appearing to participate in the affront, and then left the place. The most remarkable circumstance is, that the young of the corn-bunting are hatched before those of the owner of the nest; whose eggs, in fact, are never hatched at all, being pushed out of the nest; and in a manner at present unknown.

The following is an instance of loss being singularly supplied. A box, fitted up in the window of a room, became the abode of a pair of wrens; but here, unhappily, they were not secure from cats, to which they have a strong dislike; for, gleaning among the currant-

bushes and other shrubs in the garden, those lurking foes often prove fatal to the feathered race. Of one of these, the wrens referred to were unconsciously in danger; for already was the nest built and two eggs laid, when, one day, the window being open, as well as the room-door, and the hen-bird venturing too far into the room, a cat sprang upon her, and made her a prey.

Curious to see how the survivor would act, an observer carefully watched him for several days. At first he sung with great vivacity for an hour or so, but, becoming uneasy, he went off for a short time. On his return, he chanted again as before, went to the top of the house, of the stable, and of a weeping willow, that she might hear him; but not finding his mate, he returned once more, visited the nest, ventured cautiously into the window, gazed about suspiciously, his voice sinking to a low and melancholy note, as he stretched his little neck about in every direction. Going to the box, he seemed for some minutes at a loss what to do, and soon after, went off, and was seen no more that day. Towards the afternoon of the following one, he again appeared, accompanied by another mate, who, after great hesitation, entered the box, while he warbled forth his notes with great joy. After remaining there about half a minute, they both flew off, but soon returned, and began

instantly to carry out the eggs, feathers, and some of the sticks, supplying the place of the latter with materials of the same sort ; and they succeeded in raising a brood of seven young ones, all of which escaped in safety.

An equable heat is necessary to the hatching of eggs ; but this may be supplied in very different circumstances. According to Pliny, the Roman Empress Livia took an egg, and carried it about in her bosom, and when she was obliged to lay it aside, gave it her nurse, for fear it should be chilled. Similar efforts are of recent date. Reaumur says, that one lady hatched four goldfinches out of five from the same nest ; and other instances occurred of the same kind. There was great enthusiasm for such experiments at the time, but it was of short continuance.

The Egyptians have long been famous for the art of hatching fowls' eggs by artificial heat. Though obscurely described by ancient authors, the practice appears to have been common in that country in very remote times. In Lower Egypt there are more than a hundred buildings for this process, called máamals ; and in Upper Egypt there are more than half that number. The máamal is built of burned or sun-dried bricks, having two parallel rows of small chambers and ovens, divided by a narrow, vaulted passage. Each

chamber, according to Lane, is about nine or ten feet long, eight feet wide, and five or six feet high, and has above it a vaulted oven, of the same size, or rather less in height. The chamber communicates with the passage by an aperture large enough for a man to enter; and with its oven by a similar aperture. The ovens, also, of the same row, communicate with each other, and each has an aperture for the escape of smoke.

The eggs are placed on mats or straw, one tier above another, usually to the number of three, in the small chambers, and fuel is placed on the floor of the ovens above. The entrance of the máamal is well closed. There are two or three small chambers before it, for the attendant, the fuel, and the chickens newly hatched. Each máamal contains generally from twelve to twenty-four chambers for eggs; and receives about a hundred and fifty thousand eggs during the annual period of its continuing open. One quarter or a third of this number usually fail. The peasants of the neighbourhood supply the eggs; the attendant of the máamal examines them, and afterwards commonly gives one chicken for every two eggs that he has received. The operation is performed only during two or three months in the year, in the spring; and earliest in the most southern parts of the country.

The manager, accustomed to the art from his youth, knows the exact temperature required for success, without any such instrument as our thermometer. On the twentieth day, some of the eggs first put in are hatched; but most on the twenty-first day, that is, after the period required in ordinary circumstances. The weaker of the chickens are placed in the passage, the rest in other apartments, where they remain a day or two, before they are given to the persons to whom they are due. According to an Egyptian newspaper, published on the 1st of March, 1831, of our era, there were actually hatched in this way more than seventeen millions of fowls' eggs.

Reaumur, after various experiments, tried to take advantage of the heat of the bread ovens of a nunnery in France. Having ascertained the heat of a room, situated over the bake-house, and provided for its being supplied uniformly, he arranged the eggs on the shelves of a small cupboard, placed in this chamber, and committed the care of them to the inmates of the institution. A single box, containing a hundred eggs, was entrusted to one of them, who was very ingenious; and, though half proved useless, twenty were hatched one day sooner than they would have been by a hen. It was thus supposed, that by rooms over the ovens in use,

chickens might be multiplied at a great rate; but the plan has ended in a few experiments.

In this country similar efforts have been made, by the agency of fire and steam. A remarkable and successful one appears in the use of a machine, which was exhibited some years ago in Pall Mall. To it has been given the singular name of the Eccaleobion, meaning, "I bring," or "call forth life." It appears to be an oblong, square, wooden box, about nine feet long, three broad, and three and a half high, and covered, excepting the doors, with cloth. As the doors are glazed, its eight divisions, in which the eggs are spread promiscuously without any covering, may be seen: the power in operation is within; and the whole stands on a table, and has no connexion with the walls against which it is placed. The Eccaleobion nicely adapts the heat required to the state of the egg. The temperature suited to a thousand eggs during the last week of incubation, would not call forth life in a thousand fresh eggs; while the temperature necessary in the former case would be fatal in the latter. The heat actually required is therefore secured; and so long as eggs can be obtained plentifully and good, the average of birds hatched by the machine is said to exceed one hundred daily, or about forty thousand per annum.

CHAPTER II.

THE PELICAN'S NEST — CHANGES WHICH TAKE PLACE DURING
INCUBATION — PROVISION MADE FOR THE BIRDS FIRST HATCH-
ED—PARENTAL CARE.

IT will now be desirable to consider particularly the hatching of eggs by the parent bird. Our poet Montgomery has said, in reference to the pelicans he has so beautifully described :—

The noble birds, with skill spontaneous, framed
A nest of reeds among the giant grass,
That waved in lights and shadows o'er the soil.
There, in sweet thralldom, yet unweening why,
The patient dam, who ne'er till now had known
Parental instinct, brooded o'er her eggs,
Long ere she found the curious secret out,
That life was hatching in their brittle shells—
Then, from a wild rapacious bird of prey,
Tamed by the kindly process, she became
That gentlest of all living things—a mother.

Various indeed are the situations in which hen-birds pass through this remarkable process. The engraving

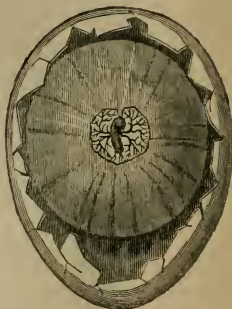
shows the wood warbler in her ground nest ; while others may be discovered in very different circumstances.



The Wood Warbler.

Our chief knowledge of incubation arises, however, from the attention that has been given to the domestic hen ; and this, therefore, we proceed to notice. In a few hours after the hen has been brooding over her eggs, a con-

siderable alteration takes place. The form of the embryo changes ; it acquires length, and its progress is seen by a blood-vessel issuing from either side, branching into numerous smaller ones, which unite at their termination, and become a boundary on the covering of the yolk. The chick is the centre of this net-work of vessels ; and as the embryo increases so do they multiply, until they nearly pervade the membrane of the yolk. It appears from a recent experiment, that when these vessels are first formed, and probably before, each branch is accompanied by a vessel carrying yolk into the body of the chick ; and thus there is a supply for its sustenance and growth.

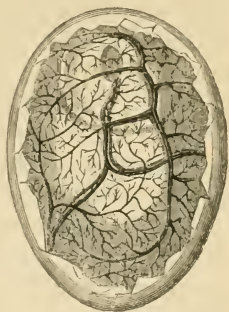


Early Change.

Between the third and fourth day a remarkable change may be perceived. The yolk becomes flattened, and a portion of the white has penetrated the yolk-bag. A vesicle, as it is called, has now so far become formed, as to have passed from the body of the chick to the lining membrane of the shell ; and as the embryo grows,

so does this vesicle increase. It is full of blood-vessels — a system of arteries and veins — carrying livid red blood from the body of the chick, and returning it a bright red colour, fitted for every purpose it is designed to answer.

If an egg be opened between the twelfth and thirteenth day, the pulses of the numerous blood-vessels will be seen propelling their contents, and presenting to the eye a beautiful spectacle. At the beginning of the third day, however, the beating of the heart is perceptible, although no blood is visible. But only a few hours elapse, and two vesicles containing blood appear, one forming the left ventricle, the other the great artery. The auricle of the heart is now seen; and the writer will never forget the pleasure with which he some time ago beheld an egg at this stage, exhibiting the passage of blood to the unassisted eye.



Nine days after Incubation.

About the sixth day, the bare wings and legs may be fully seen; the eyes are large and prominent, the brain begins to have a consistent form, and a little later the

beak opens for the first time. The additional growth of a few days shows the wings and the body covered with short feathers ; and that which a short time before was a shapeless mass, has now form, proportion, and organic life. About the fifteenth day the yolk-bag begins to be received into the body of the chick, as is also the white, which disappears from admixture with it.

On the eighteenth day, the faint piping of the little tenant of the shell is heard ; respiration has therefore taken place. The vesicle, which had increased with the growth of the embryo, has continued to enlarge over the surface of the membrane of the shell, which now it entirely surrounds, thus forming an external covering to the yolk. The large blood-vessels which connect the chick with this membrane—any one of which if left open would prove fatal to the bird—begin to be sealed and shrink, and preparation is making for its escape. The position of the chick is such as to occupy the least possible space. The head, which is large and heavy in proportion to the rest of the body, is placed in front of the belly, with the beak under the right wing. The feet are gathered up, like those of a bird trussed for the spit. The tip of the upper part of the bill is supplied with a thick, hardened, horny point ; and with this it makes a mark within the shell, thus preparing it to be

broken. And though the position of the bird is singular, and apparently uncomfortable, it is by no means cramped or confined, yet there is space enough for the head and neck to acquire sufficient force to break through the shell, and to effect its escape.

The air bag, placed at the large end of the egg, as any one who examines it will readily perceive, ought now to be noticed. It is found in the eggs of all birds, but its size does not seem to vary either with that of the egg or the bird. Mr. Towne, of Guy's Hospital, to whom we are indebted for the most recent and satisfactory information on this subject, has exposed the errors that have prevailed in reference to the structure and use of this part. He observed, that the lining membrane of the shell was much changed during incubation, and that by the alterations that took place he could tell how far the process was advancing successfully. The floor of this reservoir of air, however, did not change ; it remained thin and semi-transparent, and he proved it to be a distinct membrane, unconnected with that of the shell. The use of this inner lining membrane, as he calls it, appears to be to hold the contents of the egg suspended within the shell, and thus protect the chick from being bruised, which might otherwise happen were the egg put in motion. It acts to the chick as a natural hammock which the sailor

has suspended between the decks of the vessel ; thus the little bird swings along with its movements, and is kept from being injured by the shell.

But what is the use of the air contained in this bag ? The answer of this intelligent observer, founded on careful experiment, is at variance with the opinion commonly entertained, that air was first supplied by this means to the earliest-formed blood-vessels of the chick. It appears, that it does not come into use until the nineteenth day, which is within two days of the little bird leaving the shell. Great changes are now to take place ; the large vessels of the vesicle already described, which were of so much service, are about to be set aside, and the power of breathing is to take their place. From this time, therefore, they shrink and shrivel, and at the end of the twenty-first day they are detached from the body of the chick, and their remains are left in the shell when the bird has quitted it. It is also worthy of remark, that the distention of the lungs by air is the cause of the vigour so necessary in breaking the shell. And it may be added, as a curious fact, that the bag is not filled with atmospheric air, for if the larger end of an egg be punctured with the smallest needle, the embryo dies.

It has been stated, that between the third and fourth

days the yolk appears flattened, and the albumen, or white portion, begins to be mixed with it. On this point there has been much dispute; but Mr. Towne appears to have set it at rest. On examining the contents of an egg at this period, he found on the lower part of the yolk, or that opposite the embryo, a white circular line, nearly the size of a halfpenny. On continuing this inquiry, he observed the yolk-bag within this circle became clouded, stretched, and wrinkled. After examining many eggs, moreover, he at last found one where the yolk-bag was ruptured within this circle; but the yolk had not lost its form, nor had the white passed through the opening. On removing the portion of thick white, which adheres to the lower part of the yolk-bag, from a goose egg of fifteen days, a great part of the contents of the bag immediately escaped. He now observed a natural opening in it larger than a shilling, skirted by a vessel which rendered the boundary of the opening so strong, that he could readily introduce his finger and withdraw it, which he did repeatedly without its giving way.

It appears, therefore, that at the appointed time a rent is made in the membranes of the yolk, at that part opposite to the embryo, through which the thin white passes, and immediately mixes with the yolk, while the

former sinks to the bottom, becomes more dense, and actually plugs up the opening. It next becomes surrounded by a vessel which contracts, thus reducing the size of the opening; and as it does so, the thick white is received within the yolk-bag, until, in the hen's egg, at the thirteenth or fourteenth day the white has nearly all passed into the yolk-bag. The opening is entirely closed, and a very small portion of slimy matter is all that remains without.

The manner in which the embryo is kept at the top of the egg has already been noticed, but when the white is thus mixed with the yolk, there is a great change of circumstances. How, then, is the chick found at the upper part of the egg? Most probably, the thick white sinking to the bottom by its own gravity, causes the embryo, which is exactly opposite, to rise to the highest point.

The writer has heard the sounds noticed by Reaumur, of the chick hammering on the shell with its beak, but he has not been able to observe what that eminent naturalist discovered, through the covering membrane,—the little creature at work. The result of the early efforts of the bird is a small crack, which is usually nearer the larger than the smaller end of the egg. The membrane is rarely ruptured at first, even when the

hard part of the shell is detached; and at this Reaumur observed a chick at work, not pecking it, but, as it seemed, trying to make it thinner by constant friction.

As the strokes are continued the first cracks increase, always cutting the egg across, and fresh pieces of shell are driven off. The chick turns on its own body meanwhile from left to right, probably doing so by means of its feet. The fracture varies in breadth in different eggs, and is even of different breadths in the same egg. The effect required is the separation of the hard shell, and then of the membrane. All chicks do not accomplish this task in the same time. Some complete it within an hour, others have been observed at work for several days together. It is, however, desirable that too early an escape should not take place. The little creature should take up the unconsumed portion of the yolk into its body—a provision which will suffice for four and twenty hours. If its exit takes place before this is done, it is certain to die a few days after it is hatched.

Connected with this fact a beautiful provision is observable. All who have noticed the hatching of chickens are aware, that some are produced earlier than others. If, then, the first of the brood must immediately be fed, and the mother had to leave the nest in search of food,

the remaining eggs would suffer injury for want of the necessary warmth; but now this evil is completely prevented.

The shells of birds' eggs are nicely adapted in thickness to the strength of the chick that is to escape. The little canary could not break through a shell like that of a barn-door fowl; and were the shells of that bird as thin as those of a goldfinch they would all be crushed by her pressure. The chick of the pheasant would try in vain to break the shell of an ostrich, of which a drinking cup has often been formed, thicker than a china cup, almost as hard, and sometimes seventeen inches in circumference. How much is there to admire in this nice adjustment! The shell, however, becomes more brittle by the process of hatching, and at the same time the lining membrane is partially separated.

Sometimes the fracture of the shell does not exceed about three-fourths of the circumference. However this may be, the whole mass of the body is brought into action, the feet being used as a lever. By repeatedly pushing the body forwards, the chick gradually raises the upper portion of the shell, and at length tears off all its fastenings. Should any part remain, it becomes a sort of hinge, which allows the lid to fall on one side. It is sometimes found placed within the other portion,

like one cup in another, and at others, thrown to a considerable distance. Thus the work of liberation proceeds till the brood is hatched, and the young become, in another way, the objects of their parents' care.



Partridges.

Marvellous, indeed, is the process which has now been briefly described ; and it will appear still more so, when it is remembered, that effects greatly vary, when the substance employed; and the means in operation, are apparently the same. Seventeen hundred years ago, Galen said : " Take three eggs, one of an eagle, one of a goose,

and a third of a viper; and place them favourably for hatching. When the shells are broken, the eaglet and the gosling will attempt to fly, while the young of the viper will coil and twist along the ground. If the experiment be protracted to a later period, the eagle will soar to the highest regions of the air, the goose betake itself to the marshy pool, and the viper will bury itself in the ground." How, then, can we refuse the acknowledgment, which ought to be made with profound adoration, "This is the finger of God!"

Wherever we look, his works show forth his perfections, and demand our praise, but with the poet we should say :—

Nature with open volume stands
To spread her Maker's praise abroad;
And every labour of his hands
Shows something worthy of a God.
But in the grace that rescued man
His brightest form of glory shines;
Here on the cross 'tis fairest drawn
In precious blood, and crimson lines.
Here his whole name appears complete;
Nor wit can guess, nor reason prove,
Which of the letters best is writ,
The power, the wisdom, or the love.

THE FEATHER.



THE LYRE BIRD.

THE FEATHER.

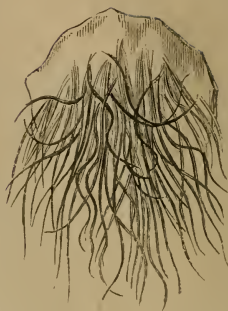
CHAPTER I.

GROWTH OF A FEATHER.

ON the arms of one of the companies of the city of London is the motto, "Nothing without God." He, alas! is often forgotten; and even when some majestic object calls the Creator and Preserver of all to mind, it is frequently overlooked that his hand is equally manifest in what is minute, and apparently insignificant. It is quite possible, from the depravity of man, for the grandest scenes in nature to awaken no thought of Him who spake, and they appeared; but should the traveller, as he surveys the ocean, or a range of lofty mountains, muse for a moment on God, he may not feel that a single feather from the plumage of the bird that flies over them, reveals also his power, his wisdom, and his goodness. This, then, is the fact which is now to be proved: its examination will doubtless yield a reward.

It will first be desirable to notice the growth of a

feather, which consists of three parts: the barrel, the shaft, and the vane. When a bird leaves the egg, it is covered in all parts, except the under side, with a downy kind of hair. On examining its first garment closely, several little tufts of ten or twelve hairs each will be observed, like the fibres of a camel-hair pencil. Each tuft



grows from a bulbous root in the skin, just as the parts of the future flower rise from the round root of the tulip or crocus. Commonly the first robe of down soon falls off; but in the eagle and other rapacious birds, the tufts adhere to the feathers for a considerable time.

Hair-like Feathers of a newly-hatched Bird.

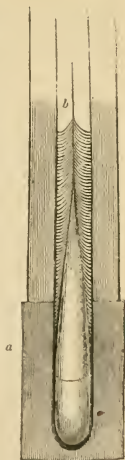
Here, however, is another very remarkable fact. While the down remains, as it usually does, a marvellous apparatus is being formed, which may be called a feather-manufactory. If we go to a type-founder, we shall see that to cast a letter, as C, or M, or S, a mould of it is formed, so that when the melted metal is poured into the mould, the letter C, or M, or S, for the printer to use, is produced. Now, little as it may

be thought, a mould is made for every feather. First appears a small cone, which in a few days lengthens into a cylinder, like the round part of a quill, having



Productive Capsule of a Quill Feather.

a pointed end. Here then is the mould. Inside this cylinder, and at the pointed part, the materials of the several portions of the feather are formed, while the lower end receives the blood-vessels to nourish the pulp. At the very time in which the outer covering of the shaft of the feather is growing in one place, the spongy substance is deposited in others. The parts which form the vane of the feather are, however, produced first. They do not grow from the base, like hairs from the head; but the materials composing the fibres or threads are, so to speak, cast into moulds, where they harden, and acquire their exact shape. It is probable, that small parts of these fibres yet to be described, and called fibrils, are formed in moulds still more minute.



Productive Capsule of a Quill Feather, opened: *a*, membranes cut square to show the mould, *b*.

As the parts of the feather thus advance below, those which are completely formed rise above the skin, carefully covered, however, for a short time; but soon they unfold, and assume their proper shape. On the feather becoming perfect, the substance which formed it dries up, the blood-vessels which nourished it disappear, and thus we have the pith which is removed from a quill before making a pen. Geese are sometimes plucked too soon; the feathers being still young; hence the soft barrel is gorged with blood.

Marvellous indeed, then, is this feather-manufactory. But let it be observed, that it is not merely in action once in the life of a bird: all its feathers are generally moulted annually, and even at shorter periods. A new mould must, therefore, be produced every time a new feather is formed. Who, then, that admires the skill of the type-founder, does not feel as these facts are



Quill Feather in process of completion. Portions of the bulb and shaft removed to show the interior. c, the productive capsule drying up.

duly considered, that a far higher tribute is due to the Author of this process, infinitely more marvellous?

A beautiful provision for the young bird, before its feathers are fully formed, appears in the tenderness of maternal care. It finds the needed warmth and defence under the wings of its parent. No wonder that an image derived from this should be employed in Scripture to exhibit the Divine regard. Our Lord adopted it when he said, "O Jerusalem, Jerusalem, how often would I have gathered thy children together, even as a hen gathereth her chickens under her wings, and ye would not!" Had they received him as the Messiah promised to the fathers, every evil would have been averted, and every blessing secured.

As certainly is He able and willing thus to interpose for us. Guilty, we need pardon; defiled, we need renewal; condemned, we need deliverance from the curse of the law. Be it ours, then, to receive His gospel, to trust in His mediation as our only refuge, and thus to find that Christ is "made unto us wisdom, and righteousness, and sanctification, and redemption."

Ah! see where he stoops from his sphere,
And bows to the earth his bright wings
'Tis the voice of an angel I hear,
'Tis the song of redemption he sings.

“ His name shall be JESUS ”—the Name
All mighty to save or destroy :
To the careless a beacon of flame,
To the contrite, an anchor of joy.

I have tried it when burdened with woe,
When the heart has been scared by its fears :
It quenches the darts of the foe,
It lights up this valley of tears.

Pronounced in the whispers of prayer,
It sets the poor prisoner free,
It hushes the groan of despair,
And gives confidence—even to me.



CHAPTER II.

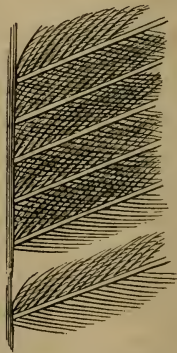
THE FULL-GROWN FEATHER.

Now let us look at the full-grown feather. Take it in your hand: "Light as a feather," has long become a proverb. But it is also strong. In the upper part of the shaft is a material, used in no other class of animals, and in no other part of birds. The pith is also a very peculiar substance: it is neither flesh nor bone, membrane nor tendon. Like the former, it is made and used for one special purpose. The quill is composed partly of circular fibres, which must be scraped off in making a pen, or else it will split roughly, and make what boys call "cat's teeth." This part is the base of the feather, and serves as a sheath while the feather issues from the skin, and during its future growth.

If now the shaft be examined, it will appear divided into two portions by a long groove, and from each side proceed the parts which form the vane. One of these is usually stripped off in making a pen. The vane is formed to oppose proper resistance to the air. Rub the feather up and down in the line of the stem, and

no difficulty will arise ; but press it in the direction of its greatest width, and it will resist the effort. And here is design : the impulse of the air occurs just where the feather does not yield. It wants strength here, and here it has it.

The resistance too is given, remarkably indeed, by a number of fibres or threads. They appear united, but by what means ? No glutinous substance can be detected. The microscope reveals the secret. On the margin of these threads are fibrils, fitted to unite together, something like as many hooks and eyes. A thousand of these have been counted in the space of an inch. They are of two kinds ; one being branched or tufted, and bending downwards, while the others do not divide into branches, and are directed upwards. They act like the fingers when the hands are clasped together.



Apparatus for hooking together the fibres of a Feather. (Example, Common Quill, greatly magnified.)

The close texture of the vane arises from this interlacing of these threads. When, too, after being separated by accident or force, they are again brought

together, they re-unite at once, and the vane is as smooth and firm as it was before. Draw your finger down the feather, against the grain, and perhaps some of the threads will be broken off; but if it be drawn the other way, all of them will appear in order.

It is worthy of remark, that the part of the plumage first wanted by the bird is the earliest produced. Thus, in some cases, wings are not needed so soon as clothing, and hence the coat of down precedes the means of flight. No sooner is a young partridge hatched, than it runs off to pick up what gamekeepers call emmets' eggs, properly the pupæ, or chrysalises of the ant, which the parent bird scratches up for her brood from the earth. It is not necessary that the partridge should fly for some time; and accordingly, from the first, the body is defended by a close-set downy covering, while all the strength of the bird is given to the parts in use, the thighs, legs, neck, and bill. The wings are afterwards gradually formed.

A contrast to this appears in the case of a blackbird or thrush. The little songster of the woods must fly as soon as it leaves the nest; and hence, while its body shows only a few scattered bunches of weak, downy, hair-like feathers, the quills and other wing-feathers are rapidly formed.

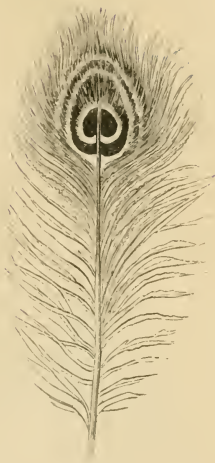
The feathers of birds are always exactly suited to the circumstances in which they are placed. The vulture, for instance, has been called one of the scavengers of creation. It lives in regions where the largest animals abound, where death is frequent, and where putridity speedily follows, filling the air with pestilence. Most important is it, therefore, that the masses of dead matter should be speedily removed; and for this provision is made. On the death of an animal, though not a wing should be visible in the sky, yet with incredible swiftness, multitudes of vultures are gathered together from various parts. Now begins the attack, and it continues till only the bones of the carcass are left, to be borne away in the night by hyenas and jackalls. Other cases might be mentioned in which the vulture is of equal service. All this is provided for in the structure of its head and neck. Often buried as they are in a putrid mass, had these parts been covered with feathers, the bird would have been greatly inconvenienced; and so there are none. Even the skin on the breast is more or less bare, and at most is covered with down, or short close feathers.

How remarkable are the feathers that form the long train of the peacock! Here is a star painted on a great number of small feathers, all beautifully arranged as

they have found their way from the root. Not the slightest error of pattern or arrangement can be detected, even among more millions of feathers than fancy could conceive.

Wonderful as the whole picture is, its parts will appear still more so. Taking one-half of the star, the places and proportions of the several colours differ from those of the other half, as do their lengths and obliquities; yet a single picture is produced, including ten outlines, which

form also many irregular yet unvarying curves. Still further, there is a perfect correspondence in the two halves; not from the texture of either being first formed, and then receiving a complicated picture; on the contrary, each fibre takes its place ready painted, yet never failing to produce the pattern. Nor is this all; every annual renewal of this picture is equally accurate,



Feather of the Peacock.

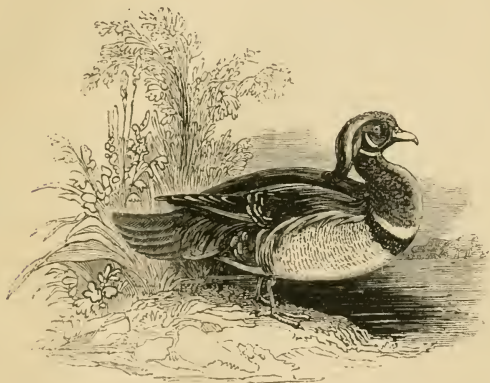
as it has been in every peacock from the creation of the world. Well may the question be proposed, "Gavest thou the goodly wings unto the peacocks?" Well may we pause, filled with admiration at such a display of power—a power no less than that of God.

A structure, so wonderful and delicate as the feathery garment of birds, is preserved in its comfort and beauty by an instinct not a little remarkable. Soon after the nestling opens its eyes, even while the feathers have not replaced its first covering of down, it may be seen turning its head, and going over with its bill all the little bits of its garment, and the ends of all the sprouting feathers it can reach. It displays the same care throughout its future career. The instant any of the feathers of the bird are soiled, it sets about trimming them, perhaps from the uncomfortable feeling produced. Thus nibbling its plumes, it soon frees them from any incumbrance, and places them all in their proper position.

The ruby-throated humming bird, as it settles on twigs or branches, frequently opens and closes its wings, pluming, stroking, and arranging the whole of its brilliant apparel with neatness and activity. It is particularly fond of spreading one wing at a time, and passing each of the quill-feathers in its whole length through

the bill, when, if the sun is shining, the wing thus plumed is extremely light and transparent.

Water-birds are, if possible, more diligent in trimming their feathers than land-birds. This may partly arise from the very close texture of their plumes, and from the air being quickly felt should it enter any open



Summer Duck.

space. This closeness of the feathers serves to shut out the water which the birds frequent, and aids their progress by the smoothness of its surface.

CHAPTER III.

COLOURS OF FEATHERS.

HAD we paused before this, enough has been stated to prove that even a feather, apparently insignificant as it is, surpasses all the productions of human power, and is worthy of the hand "that stretcheth out the heavens as a curtain, and spreadeth them out as a tent to dwell in." But other wonders await us.

Feathers exhibit in their appearance an amazing variety. Let the most lively fancy be tasked for forms they may assume, and hues they may bear, yet how meagre will be the results of its utmost efforts ! What is a finite compared with the infinite mind !

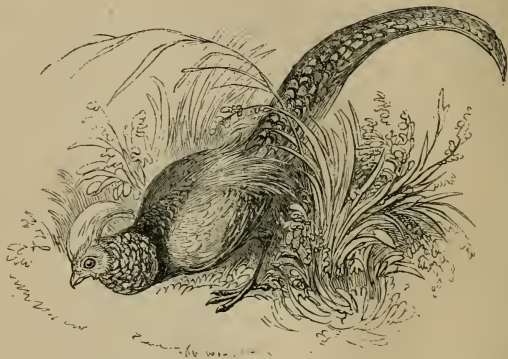
The plumage of the male bird is generally far more brilliant than that of the hen ; and when it is so, the young always put on first the plainer dress of the mother. When there is little difference between the cock and the hen, the young have a particular and distinguishing plumage of their own.

Colour is intended for important purposes, and not merely, as some suppose, for beauty. It is, in fact, a mode of concealment, the most universal of all means

of defence, and one that appears in every race of animals. As the strength, the weapons, and the velocity are all on the side of the pursuer, colour is much more resorted to, to defend birds than any other creatures. In the partridge, the quail, the woodcock, and the snipe, for instance, the likeness of their colours to the brown earth on which they move, is such as often to conceal them from every eye, and even from the acute and piercing sight of the hawk and the kite. The hovering foe may be observed above during the chase, though the prey has not escaped ; deceived also by smaller birds, even when the accordance in colour is not great. Often do they shift their position under the eye of the hawk longing to pounce upon them, and then stop, as if they knew the colour of the spot on which they are "cowering and squatting," as White calls it, were a sure defence.

In this there is a display of Divine goodness, of which there is a special instance when the males are furnished with the most beautiful plumage, while the females are of a dull earthy colour, so that they can scarcely be distinguished from the ground on which they sit. This difference particularly appears in the pheasant, peacock, and duck tribes. Look at the golden pheasant, the "gold-flower fowl" as they call it in China, with its crest so delicately silky, and of a fine amber yellow ; the rich

orange-red feathers of the back of the head and neck, edged with a line of black; the glossy and greenish-black feathers, having rounded edges, which lie on the



Golden Pheasant.

top of the back; while this is of rich yellow, and the under surface is intense scarlet; and blue, and chesnut-brown, and black, adorn its tail and wings. But the female is not thus gay and splendid in appearance. On the contrary, it is of a uniform rusty brown, with darker marks and spots; and the tail is comparatively short. The difference between the drake and the duck, and

the peacock and peahen, have often been noticed ; a similar one occurs in the chaffinch, the yellow-hammer, and many other birds. But where is the limit ? Just where weakness ceases, and concealment is not needed ; because the birds are able to defend themselves. Is not here, then, a display of infinite wisdom ?

But it may be asked, What becomes of the birds that dwell in cold regions ? For them, also, it may be answered, a benevolent provision is made. The ptarmigan, for example, inhabits brown heathy moors and rocky wilds, overgrown with shrubs of a thousand mingled tints ; and during summer its plumage is adorned with stripes of black and brown. But, did these hues remain, the hawk or the snowy owl might easily make it a prey, when the snows of winter fall and reveal it fully to their view. What, then, is the course of Him who makes even the feathered tribes his care ?

As winter approaches, the ptarmigan is clothed in white : not by moulting its feathers ; for how could it bear such a loss — a loss to be only slowly replaced at such a time ? In a way not yet understood, each individual feather changes its colour ; the brown and the black become white. All are white, except the tail-feathers, but these are short and not seen ; why then should they change ? Thus the ptarmigan may safely

burrow in the snow, or search beneath it for leaves and berries ; its enemy may look on, but its snow-white covering is its defence. The same change passes on the snowy owl, the snow-finch, and the snow-bunting. —All thy works praise thee, O God ; they tell us of thee ; they ask our tributes : how great are our insensibility and guilt, if with such displays of thy perfections as creation and providence present, and all the light of that word which thou hast magnified above all thy name, we fail to render thee the glory that is thy due !

Another purpose is sometimes to be gained by concealment : the support of the bird is attended to by Him who feeds the fowls of the air, no less than its safety. And here, as in other instances, the same means secures both ends. Professor Jones states, that, some years ago, he was conversing with a friend on the best dress for an angler, when the latter stated that he should prefer a sky-blue coat and a white waistcoat. Amused by the remark at the moment, it soon passed away : but, some years after, having occasion to examine a large number of wading birds — the inhabitants not of the woods and mountains, nor the verdant plains, nor even the surface of large lakes and rivers, but of the marsh and the morass, the oozy lands which skirt the sea and its little creeks and inlets—birds to whom

fish afford a frequent meal ; and his friend's sky-fashioned dress, as he called it, was at once recollected. The heron, for example, catching fish as its food, by darting its beak at them with the rapidity of an arrow, has, so to speak, a light blue coat and a white waistcoat.

The design of this part of its plumage is obvious. As the fish looks upwards, these blue and white feathers conceal the foe ; the attire of its enemy is blended with the sky and clouds of the firmament : it passes onwards without fear, and is promptly seized as a prey ; when other hues would produce alarm, and the fish would hurry back in haste, or dive into the depths of the waters. This shows that the angler was right in his judgment : he knew, or very sagaciously guessed, the best means he could adopt for the same purpose.

A similar provision appears in a richly-coloured bird, called the bee-eater, which occasionally wanders as far as the British isles, but never stays to breed. This bird dwells along streams and rivers, where, like a blazing star, it courses up and down in chase of its prey. Its chief food are bees and wasps, grasshoppers and butterflies. Singularly enough, on its breast appear two white feathers, exactly resembling the blossom of a flower ; and insects, attracted by these, frequently become an easy prey.

There are still other important arrangements in

reference to colour. Our own climate is proverbially changeable, and winter is with us sometimes very severe. At its approach we increase the number of our garments, and pity those who, in the depth of their poverty, are without any such provision. But what shall the feathered tribes do at this inclement period? Multitudes avoid it, it is true, by migrating to more genial climes; but, for those who do not, there are means of defence. "In the small order of birds that winter with us, from a snipe downwards," says Paley, "let the external colour of the feathers be what it will, their Creator has universally given them a bed of black down next their bodies."

Why, then, should this course be pursued? Because black, as all wearers of it may know, is the warmest colour; that is, it retains most fully the animal heat: and here it is used that the bird may keep in the heat which arises from the action of the heart and the circulation of the blood. As small birds present, too, in proportion to their bulk, a much greater surface to the air than others, so they are much more exposed to cold, and need an attire which large birds have not. Thus, while some creatures are prepared to destroy, that inferior beings may not become too numerous, our heavenly Father, without whom a sparrow does not fall to the ground, provides for the preservation of others.

CHAPTER IV.

THE WINGS.

OUR familiarity with the appearance of birds prevents our being duly impressed by the wondrous contrivances they exhibit; and hence it has been said, that could a person who had never seen a bird, be presented with a plucked pheasant, and set to invent a covering which should unite, in the highest degree, the qualities of warmth, lightness, and least resistance to the air—giving it also beauty and ornament—he would be the person to behold the work of the Deity, in this part of his creation, with the sentiments which are due to it. But will not some valuable impressions be produced by the facts that have been stated, and others that still remain?

The wings of a bird are in every way complete. Thus they are moved by large muscles, which, taken together, are generally heavier than the rest of the body; and the merry-thought, placed at the origin of the wings, and stretching from the one to the other, is a firm basis for their support. It is very elastic, and therefore tends

to restore them to their proper place, after being disturbed by any violence.

There is a great diversity in the flight of birds. Some close their wings every three or four strokes, flying by jerks, and having a waving motion, like wagtails, woodpeckers, and most small birds. Others fly smoothly, and their motion is even; and some buoy themselves in the air, as the kite and the hawk, without any apparent motion of the wings.

It is stated that a falcon, belonging to Henry iv. of France, escaped from Fontainebleau, and twenty-four hours after was found at Malta, a distance of not less than one thousand three hundred and fifty miles. Supposing the bird to have been on the wing the whole time, this velocity is equal to fifty-seven miles an hour. Such birds, however, never fly by night; and, allowing the day to have eighteen hours' light, this would make its progress at the amazing rate of seventy-five miles an hour. The probability is, that the bird had not so many hours of light for its journey, and that it was not retaken at the moment of its arrival, so that its actual course was even more marvellous. Colonel Thornton considers that a falcon pursuing a snipe will, in addition to its numerous turns, pass over the space of nine miles in eleven minutes.

Even a sparrow is known to fly at the rate of more than thirty miles an hour. The occasional flight of a hawk has been considered by intelligent observers as not less than one hundred and fifty miles an hour, when either pursued or pursuing, and at the full stretch of its powers. One hundred miles is thought a fair reckoning, not only for the hawk, but the woodcock, snipe, and similar birds, during their migrations. The usual flight of the eider-duck has been found to be at the rate of ninety miles an hour.

The extreme speed in these cases will still further appear from comparison with that of other creatures. One horse, greatly celebrated, passed over a space of four miles in eight minutes, which is but thirty miles an hour, and could not long be continued. Another is said to have gone at the rate of a mile in a minute, but this was for a very short distance.

A different arrangement from that of the hawk or eider-duck, and one as peculiar, was required for the ostrich. It dwells in the desert, and, when attacked, trusts for safety to its speed. Stretching itself to the utmost, and vibrating its opened wings, it scours away, and sometimes defies the Arab and his horse for eight or ten hours. Hence it has muscular thighs, not covered with feathers; a foot divided into two toes only, each

one being well padded beneath, and the whole strongly resembling the hoof of the camel. Power was required



Foot of the Ostrich.

for these parts, and here it is supplied. But it was not wanted for the wings, and therefore they have it not. They have no fibrils to fasten the feathers closely together, as is the case with all birds designed for flight ; but the feathers hang loosely at the sides.

Go, ask thy heart, then, " what spirit thus abides
In every region? Thus minutely works in deserts ?
And thy heart shall answer, It is God."

The owl supplies another case in point. It has been said, if this useful bird caught its food by day, instead of hunting for it at night, mankind would have full proof of its utility in thinning the country of mice, and it would be encouraged and protected everywhere.

The mouse is extremely timid; it is startled by the slightest sound: if, therefore, its foe closed its wing to its side, as the partridge frequently does, with great force, that it may gain sufficient velocity, and thus its flight were noisy, the prey would hear and be gone, and the owl be without its proper meal.

Examine, then, the plumage of the owl, and it will be found full, soft, and downy. The quill-feathers are so formed, that they cannot strike against the air so as to produce the rushing sound common in the flight of birds; and especially is it so with the first quill-feather. Instead of its outer edge being plain as is usual, it is fringed with a fine comb-like line of short lashes. So loose and delicately soft, indeed, is the plumage of the owl, that it offers no resistance to the air, but yields to every breath. Thus singularly provided for the service it has to



Feather of the Owl.

perform, it passes through the air unheard by its victim; while, as its wings are of great extent, the bird

can not only make considerable progress, but whirl round, and drop directly on its prey.

Of the humming-bird, a native of one of the fair isles in which it lives, has said:—

Still sparkles here the glory of the West,
Shows his crowned head, and bares his jewelled breast,
In whose bright plumes the richest colours live,
Whose dazzling hues no mimic art can give.
The purple amethyst, the emerald's green,
Contrasted mingle with the ruby's sheen ;
While over all a tissue is put on
Of golden gauze, most marvellously spun.

This beautiful and delicate creature has excited the admiration of all who have observed it, either revelling in its native glades, or at rest in some museum. The ancient Mexicans used the feathers of humming-birds for superb mantles ; and the Indian delighted to adorn his bride with gems and jewellery plucked from the starry fronts of these beauteous creatures. Ingenuity has been employed for terms to depict the richness of their colouring ; the lustres of the topaz, of emeralds and rubies, have been compared to them, and applied in their names. The Indians call them by one which means beams or locks of the sun. Nor can we be surprised at this, when we consider the dazzling splendour of their plumage—

Delicate and beautiful,
Thick without burden, close as fishes' scales.

Humming-birds are of a lively and active disposition, almost always on the wing, performing with great rapidity all their movements, and displaying in a brilliant sun the variations of their plumage with the greatest advantage.

Each rapid movement gives a different dye ;
Like scales of burnished gold they dazzling show,
Now sink to shade—now like a furnace glow.

They remain suspended in the air in a space barely sufficient for them to move their wings. The humming noise they make proceeds entirely from the surprising velocity with which they do so, keeping their bodies in the air, apparently without motion, for hours together. When fearful or angry, their motions are very violent, and their flights rapid as an arrow, so that the eye cannot follow them.

Now, while the beauty of these birds first awakens attention, the largeness of their wings cannot fail to be observed. In most cases the size of the wings, and the strength of their quills, appear disproportioned to so small a creature ; yet, on comparing them with its necessities and the other parts of its frame, their design and usefulness are evident. The food of humming-birds is derived from the sweet juices

of flowers, or from insects which must be taken in a rapid flight, or drawn from the deep tube, or cup-shaped recesses, of blossoms which grow and hang in all directions, and which they can only reach by being suspended above or under them. All the parts not used during flight are very slender, and unfit for any long support, or assistance in obtaining food, by climbing or hanging in various positions, like the titmouse, and many of the slender-billed warblers. Here, then, is one reason for the size and power of their wings.



Feather of
the Hum-
ming-bird.



Humming-bird.

But another is, that they may pass safely through the long flights which are necessary for their preservation ; during which they have often to withstand a passing gale, a heavy shower, and even the rigour of a snow-storm. The climes they inhabit are at seasons subject to violent rains, which drench and almost inundate their abodes ; or to hurricanes, which speedily leave only a wreck of what was before so luxuriant and splendid. But, admirably furnished as they are for flight, they pass, before the dangerous season, to spots where a former wreck is being repaired, with a rapidity unknown in other climates.

The form of the wings of humming-birds nearly resembles those of the swift ; a bird whose address and dexterity on the wing are almost beyond conception, continuing in flight in the height of summer at least sixteen hours, its movements being computed at seventy feet in a second. The front outline of the wing is very much curved, and the first quill is always longest, the others gradually shortening. The plumes are narrow and compact, firmly united together, forming, when used, a substance almost like a thin plate of whalebone. The shafts of the quills are remarkably strong and elastic in all species ; but in a few they are expanded to an extraordinary degree at the base, and nearly equal the breadth of the plume.

The same arrangement is made in other instances. If short-winged birds migrate, it is to short distances. But if we turn to the frigate-bird, which is met with hundreds of leagues from land, we may discover wings prepared for extraordinary speed, and a want of that close and downy texture in the general plumage which marks a bird designed to dwell on the surface of the deep, because its province is not the water, but the air. Or, to take only one more instance, the wandering albatross has been observed between six and seven hundred leagues from land, in the middle of the Southern Ocean : it is not exceeded, therefore, by any bird in the vast spread of its wing ; and hence it can sail before the wind, or make way against it, as if that element were subject to its control.

THE SONG BIRD.



THE LARK.

THE SONG BIRD.

CHAPTER I.

MUSIC OF BIRDS — VARIETY OF TONES — STRUCTURE OF THE
ORGANS OF VOICE OF SONG BIRDS.

THE music of birds arose towards heaven before the creation of man. Adam and Eve could not have heard their melody without lively emotions, and from their days to ours, multitudes have felt with the poet when he said :—

A few, with melody untaught,
Turned all the air to music, within hearing,
Themselves unseen ; while bolder quiristers,
On loftiest branches, strained their clarion pipes,
And made the forest echo to their screams
Discordant. Yet, there was no discord there,
But tempered harmony ; all tones combining,
In the rich confluence of ten thousand tongues,
To tell of joy, and to inspire it. Who
Could hear such concert, and not join in chorus ?
Not I.

The general interest felt in the present subject has dictated its selection, with the hope that it may aid in impressing the mind of the reader with the greatness and goodness of God. It is He who has formed alike "the fowl to fly above the earth in the open firmament of heaven," and the ear which is delighted with their strains. Well may the song of a bird call forth our praises—the praises not only of the lip, but of a grateful heart.

The feathered race are remarkable for a very great variety of tones and qualities of voice, from the monotonous scream of the eagle to the rich and varied modulations of the nightingale. Not that all birds are musical. On the contrary, while each species has a note peculiar to itself, it is only to certain tribes that the power of melody is given. A voice capable of rapid inflexions, and full of harmony, has not been granted to the rapacious tyrants of the air, to the birds that play and dive among the billows of the ocean, to the wild swan and the host of water birds, that make the marsh or the dark morass their home, nor yet to the feathered creatures which yield food to man. It is to a multitude of smaller birds, the tenants of woodlands and groves, that we must listen, if we would hear a thousand voices, swelling the hymn of praise in mingled harmony. All, however, modify the voice by the will

of Him who formed them, and has caused them to utter such sounds, and speak such a language, as are required by the circumstances in which they are placed.



Goldfinches.

The cawing of the rook, the croaking of the raven, the cooing of the dove, as well as the warblings of the various birds of song, are all the results of the wisdom that never errs, and the benevolence which is inexhaustible.

This fact is apparent when we consider, that among birds there is no confusion of sound ; every feathered warbler possesses its own music, a series of notes, and a style of modulation, peculiar to itself. And it will, therefore, prove interesting to investigate the structure of the apparatus by which sounds and intonations, so dissimilar, are produced. In doing so, the organ of voice will be found extremely simple, so much so indeed, that we might be surprised at the results of such a contrivance, were it not for various facts with which we are acquainted. The organ of the human voice, for instance, though simple in the extreme, produces the most extraordinary variety and richness of tones by slight variations of muscular action, apparently too trivial for such surprising effects. But here the hand of God appears ; it is one of innumerable instances in which astonishing results are to be traced to causes apparently inconsiderable.

In birds, and also in the various animals ranged under the class Mammalia, the trachea, or windpipe, is the organ of voice. This, as is well known, is the air-tube, that leads from the back of the mouth into the lungs, and through which the air is drawn and returned, in the action of breathing. Its name is derived from a Greek word, meaning rough, because, being composed

of a series of rings, it presents a surface rough with projections and intervening furrows.

In man, and the mammalia generally, the different intonations are produced by the tension, or relaxation of two chords, stretched across an aperture; but in birds these chords are wanting, and the intonations are produced by the lengthening or shortening of the tube through which the air vibrates. The organs of voice in man have, therefore, been likened to an Eolian harp, the sounds of which are drawn from it by a current of air acting on the strings, while those of birds are said to resemble an instrument like a French horn, where the notes, on a low key, are formed by affixing additional circles of tube, and in producing various tones, the extent of the opening is regulated by the hand.

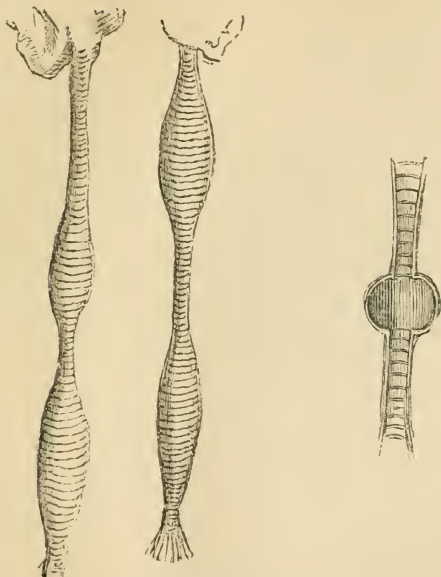
Another peculiarity should also be noticed. In man, who has a distinct articulate language, the tongue, aided by the teeth and lips, is the instrument by which sounds are formed into words; but in birds, excepting the parrot tribe, the tongue has little or nothing to do with the inflexions of their native song.

The tube of the trachea of birds is composed of firm cartilaginous rings, having two coatings of membrane, one external, the other internal. These are uninterrupted in their course, occupying the spaces, great or

small, between the rings, and thus rendering the tube very flexible. This tube greatly varies in form, length, and diameter, and these modifications produce corresponding effects on the character of the voice. Shrill, clear notes, as in singing birds, issue from short tubes; and the various inflexions of these notes are greatly dependent on the slenderness of the rings, and the enlarged spaces between them; whence arises a freedom of motion, and a consequent diversity of sound. The tube is, in such cases, governed by a single pair of muscles, which not only give it support, but adapt it to the varied motions of the neck, and influence its length.

The longer and wider the tube, and the more it is formed of broad rings, closely approximating, the more monotonous and trumpet-like is the voice. In singing birds it is straight and short; but in the tribe of waders and swimmers it offers every variety of form and convolution. In the velvet duck there is a remarkable hollow bony enlargement, situated two-thirds down the tube, made up of rings firmly ossified together. A similar formation appears also in the goosander, and in the red-crested duck. Among other birds the tube has two remarkable enlargements, with corresponding contractions.

But to these varieties of form this organ is not limited; it assumes also folds, more or less intricate.



Tracheal Tube of the Goosander
and of the Red-crested Duck.

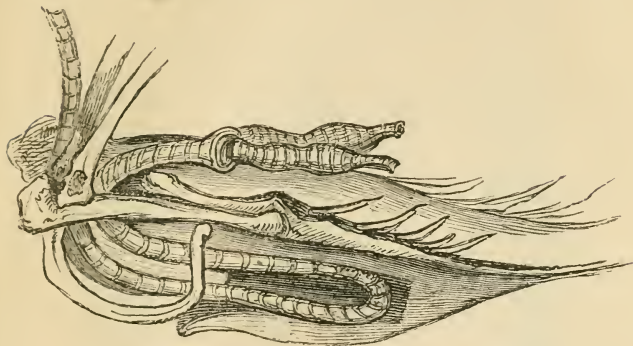
Section of a part of the Tube of
the Velvet Duck, showing the
bony enlargement.

These are of no little interest to the naturalist, for the

constancy of these convolutions is frequently of great service. They aid him in ascertaining the difference between species nearly alike in outward character, as, for instance, the three species of European swans, which are, indeed, truly distinct.

In some birds this tube assumes, as has been already intimated, most singular convolutions, of which that of the wild swan may be given as an example. In this case, the trachea is lodged in a cavity of the keel of the breast-bone, which is opened in the engraving, on page 11, so as to exhibit its convoluted course. It will easily be conceived, that the folds of this tube, by which its length is materially increased, would modify the tones of the voice. We find, therefore, such birds uttering deep, grave, monotonous sounds, with more or less of a trumpet-like clang or reverberation. Though the voice is much influenced by the figure, diameter, and firmness of the tube, this is not the part in which it is produced. The true organ of voice—the organ acting on the air as it passes, so as to give it those rapid vibrations, moulded, so to speak, into notes, high or low in the scale, by the tube of the trachea, is the inferior larynx. This is situated at the end of the tube, and is variously constituted in different birds. Every species, indeed, has its own peculiarities. Sometimes the inferior larynx is

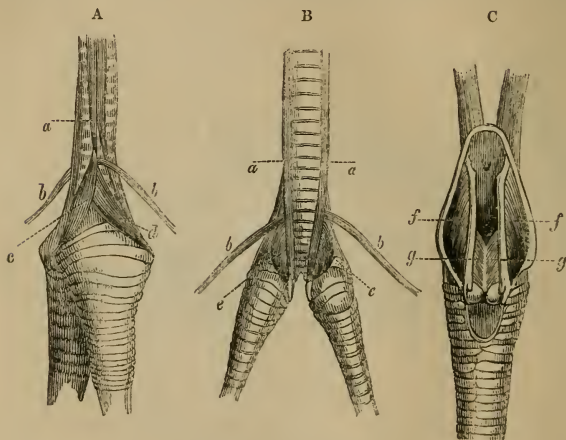
formed by the approximation of several rings, ossified more or less together, and at others, of solid bones. Nor does it vary less in form.



Trachea of the Swan.

It is by the muscles of the inferior larynx that those minute and varied movements of the organs of voice are produced, which modulate and vary its tones. These muscles are, therefore, better developed, and more numerous in birds of song, than in such as have a harsh or monotonous cry. They are termed the muscles of voice, and vary in number from one pair to five. In a few species they are altogether wanting.

The thrushes, larks, buntings, finches, warblers, swallows, and all birds of song, have five pairs of muscles of voice. The tube is here uniform, and very



The Larynx of Song Birds.

A. B. The inferior larynx; *a, b, c, d, e*, five pairs of muscles which act on the larynx. C. The upper larynx; *f, f*, pair of muscles for opening the glottis; *g, g*, pair of muscles for closing the glottis.

flexible. The muscle of the tube divides on each side into two slips. Each muscle has its appropriate place and action, by which the modulations and intonations

of the voice of the richest songsters of the grove are produced. The preceding engraving will render, it is believed, the remarks that have been made more clear. It represents the larynx; the upper extremity of the trachea, the superior opening of which is called the glottis, with the various muscles.

Simple is the mechanism which is thus apparent; but who that rightly considers the effects produced, will not perceive the operation of that God who is "wonderful in counsel, and excellent in working?"

CHAPTER II.

VARIOUS SONG BIRDS—THE LINNET—THE BLACKBIRD — THE MISSEL THRUSH—THE SONG THRUSH—THE GOLDFINCH—THE BULLFINCH—THE LARK—THE NIGHTINGALE—THE MOCKING BIRD.

AFTER having thus made some remarks on the organs of voice in birds, and on the gift of song to some of the feathered tribes, it will be desirable briefly to notice a few of the warblers which have been most admired.

The linnet is thought by some to excel all small birds in the sweetness of its notes. Its agreeable, flute-like, and even brilliant song consists of several strains, succeeding each other very harmoniously. When these are mingled with acute and sonorous tones, slightly resembling the crowing of a cock, there are many who consider the notes of the bird as peculiarly valuable. Its song is only interrupted during the year by moulting. A young one taken from the nest, not only learns the songs of birds that it may hear in the room, such as chaffinches, larks, and nightingales, but, if kept by itself, airs and melodies that are whistled to it. "It

is very pleasing and surprising," says Bechstein, "to hear a young linnet that is well taught by a nightingale. I have one, whose imitations are as perfect as possible. It amuses me throughout the year, but especially when my nightingales are silent."

The largest song bird of our own land is the blackbird: it sings early; and though there is not so much variety in its notes as in those of the thrush, they are soft and clear. The song of this bird makes a pleasant variety among the number of more sharp and trilling voices. As there are two, and frequently three broods of blackbirds in the year, the song continues through great part of the season. It is not, however, heard so constantly, for so long a time, or from so high a perch, as the song of the thrush.

Of the bird last mentioned there are different kinds. The missel thrush is very clever and persevering in finding snails and slugs in their winter retreats, and is, therefore, among the first of the feathered tribes to feel the turn of the year. Its notes are not so varied and mellifluous as those of the song thrush, but they are still both powerful and musical. As this bird is the first that is heard in the woodland, after the howling of the wind among the leafless branches, it has often been hailed, as in the following verses, with peculiar fondness.

Sweet thrush ! whose wild untutored strain
Salutes the opening year,
Renew those melting strains again,
And soothe my ravished ear.

Though in no gaudy plumage dress'd,
With glowing colours bright,
Nor gold, nor scarlet on thy breast,
Attracts our wondering sight ;

Yet not the pheasant, nor the jay,
Thy brothers of the grove,
Can boast superior worth to thee,
Or sooner claim our love.

The song thrush is far more generally distributed over the country than the one just noticed. When the situation and the season are alike favourable, these birds are in full melody early in February ; and, as there are generally two, and sometimes three broods of young in a year, the song continues till the beginning of October. The notes it includes are the finest of any of our permanent wood songs, and superior in clearness and power, though not in variety, to those of any of the warblers. They are never heard amidst desolation, and when they fall on the ear, the listener may be sure he is not far from a human dwelling.

“ During one spring,” says Mr. Knapp, “ an individual song thrush, frequenting a favourite copse, after a certain round of time, trilled out, most regularly, some

notes that conveyed so clearly the words Lady-bird ! lady-bird ! that every one remarked the resemblance.



The Song Thrush.

He survived the winter. And in the ensuing spring the Lady-bird ! lady-bird ! was still the burden of our evening song. It then ceased, and we never heard this pretty modulation more. Though merely an occasional strain,

yet I have noticed it elsewhere—it thus appearing to be a favourite utterance.”

Many have felt as Hurdis did, when he said, in reference to another favourite :—

I love to see the goldfinch twit and twit,
And pick the groundsel's feathered seeds ;
And then, in bower of apple-blossom perch'd,
Trim his gay suit, and pay us with a song.

The song of the male bird generally begins in March, and continues improving till the middle of May, at which time it is in the greatest perfection. He sings from the perch, but prefers one which is not very lofty. He begins at daybreak, and continues his strain, with little intermission, till sunset. He sings later than almost any bird ; indeed, he may be heard in the winter, and sometimes when there is snow on the ground.

The song of the male and female bullfinch, in their wild state, is very harsh and disagreeable. Yet, if well taught while young, as they are in Hesse and Fulda, where there are schools of these little songsters, for England, Germany, and Holland, they learn to whistle all kinds of airs and melodies, with so soft and flute-like a tone, that they are favourites with many. They become also very tame, and sing whenever they are required.

The bullfinch can imitate the songs of other birds ; but generally it is not permitted to do so, that it may only learn to repeat the airs that are taught it. These birds discover, it appears, when under tuition, different capacities. One learns with ease and quickness, another slowly, and with difficulty ; the former will repeat without hesitation, several parts of a tune it has learned, the latter will hardly be able to whistle one after several months of constant teaching. A seller arrives annually in London, in April or May, with birds for sale, which have been instructed in this way. They are sold at the rate of from one to several pounds each, according as they are more or less accomplished, whilst a wild one would only cost two or three pence.

The most common of the British songsters is the lark. It rises upward like a vapour, borne lightly in the atmosphere, and yielding to its motions. Its ascent is spiral, gradually enlarging, when the course of the bird is without disturbance or alarm. Its song accords with the mode of its soaring. At first it is partially suppressed, but it swells as the spiral widens.

Then oft beneath a cloud she sweeps along,
Lost for a while, yet pours her varied song ;
Her form, her motion undistinguished quite,
Save when she wheels direct from shade to light.

After descending, with a sinking note, half way, the lark ceases to sing, and drops, with the velocity of an arrow, to the ground.

The lark is greatly admired by our poet Wordsworth, who thus addresses it:—

Leave to the nightingale the shady wood;—
A privacy of glorious light is thine;
Whence thou dost pour upon the world a flood
Of harmony, with rapture more divine:
Type of the wise, who soar, but never roam,
True to the kindred points of heaven and home.

A more general preference, however, is reserved for another bird, whose notes may be heard on the return of spring. It is when the trees are covered with foliage, and the hawthorn hedge-rows are whitened with blossoms, giving out their perfume to every breeze, and a mingled profusion of flowerets bespangles bank and bray, that the voices of unnumbered singing birds are heard in united harmony. The flowers, indeed, will soon close, and many songsters will be mute; but there is one, whose voice, heard only as yet at intervals, and undistinguishable, except by nicer ears, from the general chorus, will then take up the evening hymn, in strains of richest melody. That songster is a bird of sober plumage; an unostentatious visitor to our shores, and arrayed in no gaudy trappings to attract attention—it is

the nightingale, the theme of poets in all ages, the favourite of Milton.



The Nightingale.

The nightingale is one of our soft-billed warblers—birds inhabiting our copses, groves, and woodlands ; and hence forming the genus *Sylvia* of M. Temminck, and other authors. The chief food of these birds is insects, but many devour berries and summer fruits with avidity. Most go and come with the seasons ; and of these the

nightingale is the chief. It seldom visits us before the latter end of April, or the beginning of May, and departs in August, favouring us with its residence during a limited portion of our summer months. Its localities also are as limited as its stay. In the midland counties it is scarce; in the northern it is but occasionally heard; and in the western, namely, Devonshire and Cornwall, it is almost unknown. As is the case with all the migrating birds of the great tribe of warblers, the males are the first to venture across the Channel, when they disperse over the country, resorting to thick hedges, copses, and plantations, where their song resounds at eve, and where they wait the arrival of their expected mates. The females follow in a few days, though not always, for it sometimes happens that cold winds and unpropitious weather delay their arrival for ten days, or even a fortnight.

Dr. Latham informs us, that, as is usual among the migrating warblers, the male bird "remains on the spot to which it first resorts, attracting the female by its song; and, if by accident the female is killed, the male, which had become silent, resumes his song, and will continue to sing late in the summer, till he finds another mate: in which case they will breed at a later season." To this observation it may be added, that it

is only prior to the work of incubation that the notes of this bird are poured forth in their fullest melody. At the latter end of the season, before departure, its voice has degenerated into a hoarse unmusical note.

The nightingale is universally spread over the European continent, and the proximate parts of Asia. It is the bulbul of Persian poets. Sonnini tells us, it is found in Lower Egypt. Thus, from England, through a wide range of countries, is this unrivalled songster of the Old World distributed. Who would think of such a bird being ever destroyed to swell the luxuries of the table? Yet we read of Heliogabalus feasting on dishes made of the tongues of nightingales; and Clodius Æsopus had a dish composed of the tongues of singing birds, among which those of nightingales were included. This dish, according to Pliny, cost about £6843. 10s. of our money. So much for folly and extravagant luxury!

To keep the nightingale in confinement is very difficult; and we are very glad of it. Why should we imprison the free-born tenant of the air for our gratification? Why should we feast our ears on the instinctive song of a prisoner, torn from his mate, and fluttering to visit his grove, and finish his half-built nest? Must the desires of man be pampered at the

expense of the lower creatures? We are apt to consider such animals as beings of little value, or as utterly insignificant. Not so are they in the eyes of Him, without whose permission not even a sparrow falls to the ground.

The nightingale expresses his different feelings by suitable and particular tones. The most unmeaning cry, when he is alone, appears to be a simple whistle, the sound of which is like *fitt*, but if *err* be added, it is the call of the male to the female. The sign of displeasure or fear, is *fitt*, repeated rapidly and loudly before adding *err*; while that of pleasure and satisfaction is a deep *tack*, which may be imitated by smacking the tongue.

The male and female nightingale have musical power, but so striking is that of the former, that he has been called the king of songsters. In his case, the muscles of the larynx are much more powerful than those of any other bird; but it is the compass, flexibility, variety, and harmony of his voice, rather than its strength, which calls forth so much admiration. According to Bechstein, twenty-four different strains, or couplets, may be reckoned in the song of a fine nightingale, without including its delicate little variations; for among these, as among other musicians, there are some great performers, and others far inferior. "This song," he

says, "is so articulate, that it may well be written. The following is a trial, which I have made, as that of a nightingale in my neighbourhood, which passes for a very capital singer :—

“ Tioû, tioû, tioû, tioû.
 Spe, tiou, squa.
 Tiô, tiô, tiô, tiô, tio, tio, tio, tix.
 Coutio, coutio, coutio, coutio.
 Squô, squô, squô, squô.
 Tzu, tzu, tzu, tzu, tzu, tzu, tzu, tzu, tzi.
 Corror, tiou, squa, pipiqui.
 Zozozozozozozozozozozo, zirrhading !
 Tsissisi, tsissisisisisisisis.
 Dzorre, dzorre, dzorre, dzorre, hi.
 Tzatu, tzatu, tzatu, tzatu, tzatu, tzatu, tzatu, dzi.
 Dlo, dlo, dlo, dlo, dlo, dlo, dlo, dlo, dlo.
 Quio, tr, rrrrrrrr itz.
 Lu, lu, lu, lu, ly, ly, ly, ly, liê, liê, liê, liê.
 Quio, didl li lulylie.
 Hagurr, gurr, quipio !
 Coui, coui, coui, coui, qui, qui, qui, qui, gai, gui, gui, gui.
 Goll goll goll goll guia hadadoi.
 Couigui, horr, ha diadia dill si !
 Hezezezezezezezezezezezezezezeze couar ho dze hoi.
 Quia, quia, quia, quia, quia, quia, quia, quia, ti.
 Ki, ki, ki, io, io, io, ioioioio ki.
 Lu ly li le lai la leu lo, didl io quia.
 Kigaigaigaigaigaigaigai guigaigaigaigai couior dzio dzio pi.”

Izaak Walton observes, with equal truth and beauty, “He that at midnight, when the weary traveller sleeps securely, should hear, as I have often done, the clear

airs, the sweet descants, the natural rising and falling, the doubling and redoubling of the nightingale's voice, might well be lifted above earth, and say, Lord, what music hast thou provided for the saints in heaven, when thou affordest bad men such music upon earth!"

With the nightingale, favourite as it is in many climes, the mocking-bird, which is peculiar to the New World, has often been compared. Attired in plumage having nothing that is gaudy or brilliant, he mounts on the top of a tall bush, or half-grown tree, in the dawn of a dewy morning, and, while his native groves are already vocal with a multitude of warblers, his song rises far above theirs. The ear, it is said, can listen to his music alone, to which that of all the others seems a mere accompaniment. His native notes are full and bold, and exceedingly varied. The eye is arrested with his expanded wings, his tail glistening with white, and the buoyant gaiety of his action, as irresistibly as the ear is engaged with his song. He sweeps round with great delight, and he bounds aloft with the celerity of an arrow, or descends as his notes swell or die away. While thus exerting himself, a bystander, destitute of sight, would suppose, so perfect are his imitations, that all the feathered tribes had assembled together in a trial of skill, each striving

to produce the utmost effect. Even birds themselves are frequently imposed upon by this admirable mimic;



The Mocking Bird.

they are decoyed by the fancied calls of their mates, or plunge with haste and fear into the depth of thickets, at the scream of what they suppose to be the sparrow-

hawk. It cannot, then, excite surprise, that the mocking bird has been pronounced by some natives of the country in which it is found, superior to every other.

Throughout the year, in England, we may recognise the notes of some of the feathered tribes. Amidst the snow and cold of January the cheerful voice of the woodlark invites attention. In February, the hedge-sparrow, the blackbird, the yellow-hammer, and the thrushes begin their songs, which are continued, without intermission, till the days of autumn. April,

A month of sunshine, and of showers,
Of balmy breezes, opening flowers,

brings the blackcap, with powers of song but little inferior to those of the nightingale ; the garden fauvette ; and indeed various tribes of choristers. At the close of this month we enter on the most melodious period of the year.

Every copse
Deep tangled, tree irregular, and bush
Bending with dewy moisture o'er the heads
Of the coy quiristers that lodge within,
Are prodigal of harmony.

The smaller reed-sparrow withholds his pleasant note till the cowslips appear in May, and continues singing till July. The grey linnet builds his nest, and whistles

on till August, then drops his song, and reassumes it in October, when congregating with his brother minstrels. Thus is the whole creation filled with cheerful sounds, as if to remind us that, in like manner, we should constantly pour forth the hymn of gratitude.

The complete song of birds includes: the call-note of the male, in spring; the loud, clear, ardent, and fierce notes of defiance at the sight of a foe; the soft, tender, full, and melodious warble of affection; the sounds of fear and alarm at the approach of danger; the war-cry when a bird of prey appears; the note of the parent-birds to their brood; the chirp of the young; the soft tones of the male while feeding the female in the nest; and also those which she emits in receiving the food. What a beautiful provision is here! The birds of the air are prepared by these means to express to each other their various feelings, their mutual wishes, and their wants.

It is probable that but few are familiar with "the songs of earliest birds;" it has, however, been observed by that interesting naturalist, Mr. Knapp, that they appear abroad at very different periods, as the light of the morning advances. The rook, which seems rather to rest than to sleep, is perhaps the first to salute the opening day. Always vigilant, the least alarm after

retirement rouses instantly the whole assemblage, not successively, but collectively. The robin, the last bird that retires in the evening, and one that is frequently seen flitting about when the owl and the bat are visible, also awakes very early in the morning. Next may be heard the cheerful melody of the wren, as it bustles from its ivied roost, when twilight almost hides the little minstrel from the view. The sparrow, which lodges in holes, and under the eaves of the rick or shed, where the light does not soon enter, moves rather tardily. The blackbird quits its leafy roost in the ivied ash, and mounting some neighbouring oak, it gratulates, with mellow, sober voice, the coming day. 'The plain-song cuckoo grey,' from some tall tree now tells its tale. The lark is in the air, and the 'martin twitters from her earth-built shed ;' all the choristers are tuning in the grove ; and amidst such tokens of awaking pleasure it becomes difficult to note priority of voice."

Another fact is too important to be omitted. The power of singing is not assigned to any chorister larger than a blackbird. And here we have another instance of wise and benevolent design. A large bird, pouring forth its notes, would not be properly concealed, and would therefore excite the attention of its enemies. A similar reason may be assigned for the general silence

of female birds ; a tuneful voice would endanger their safety while engaged in their maternal duties. How manifest, then, is the tender regard of God for the fowls of the air !

In concluding these remarks, it is worthy of remembrance, that pleasing as the songs of birds are to the generality of mankind, there are strains incomparably more delightful. These are grateful to the ear of the highest orders of our race, to angels, and even to God. They are the offerings of those who, though born in sin, have been renewed by the Holy Spirit, and having renounced all human hope of obtaining the Divine favour, trust in Christ alone for salvation. Such was the strain of the beloved disciple when he commenced the book of "The Revelation :"—"Unto him that loved us, and washed us from our sins in his own blood, and hath made us kings and priests unto God and his Father ; to him be glory and dominion for ever and ever. Amen." Rev. i. 5, 6. How wondrous is the love that is thus celebrated ! How great the blessings which are acknowledged ! How high the honours of true religion !

Is it the privilege of the reader to rejoice in their possession ? Happy indeed is he ; his joy is now "unspeakable and full of glory ;" and hereafter he shall

take his station at the right hand of God, where there are "pleasures for evermore." Is the contrary his condition? Then let a sense of the vanity of the world, of the evil of sin, and of the infinite value of spiritual blessings, urge him to the fulness which the gospel reveals, that the sorrows of the transgressor against God may be exchanged for the song of faith and of hope. "And the Spirit and the bride say, Come. And let him that heareth say, Come. And let him that is athirst come. And whosoever will, let him take the water of life freely," Rev. xxii. 17.

INSTINCT OF BIRDS.



MIGRATION.

INSTINCT OF BIRDS.

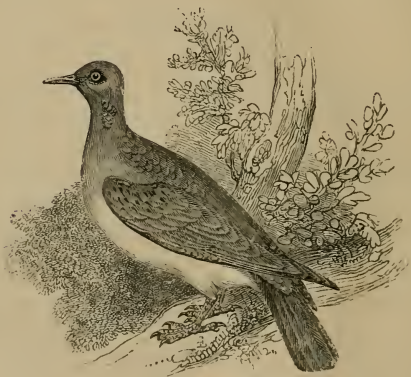
CHAPTER I.

INSTINCT ILLUSTRATED—AFFECTION AND SYMPATHY—NEST BUILDING—PARENTAL FEELINGS—BOWER BIRDS.

THE amazing diversity that exists in animated beings, from the smallest creature which has been detected by the microscope, to the animal that most nearly approaches to man, presents an interesting and profitable range for attention and research. In one particular, however, there is a striking resemblance throughout the whole series. All are prepared by what is commonly called instinct—the gift of the great and all-wise God—for the circumstances in which they are placed. In some instances, this bestowment may appear inferior to others, but it will be invariably found, when attentively examined, to be absolutely perfect. Of this, the instinct of birds furnishes a pleasing example. And

hence it is now proposed to consider it, not indeed abstractedly, but rather as illustrated by facts, many of which have only recently become known, and all of which are calculated no less to instruct than to delight.

Instinct appears, for instance, in feelings akin to those which are displayed by human beings. What



The Turtle Dove.

tenderness is manifested by the turtle dove! Its attachment to its mate has long been proverbial; but it is equalled by that of some other birds. Thus, an African bird, the grenadier grosbeak, which is about

the size of a linnet, was put with a hen goldfinch, into a cage, and after they had paired, a quantity of grass and other materials were placed in the cage, to enable them to make their nest. As soon as the hen began to sit, the grosbeak took a quantity of the grass and covered her with it; and this he did punctually every day at eleven o'clock, when the sun came upon the cage—probably the practice of birds in very hot countries.

The little love-parrot, too, sits beside his mate, and eagerly feeds her from his own bill. A pair of these birds were confined in the same cage; and when the female became ill, her companion showed the strongest marks of attachment. He carried all the food from the bottom of the cage, and fed her on her perch; and when she expired, went round and round her in the greatest agitation, attempting to open her bill and give her nourishment. He then gradually languished, and survived her only a few months.

In other cases, the feeling of sympathy seems to be peculiarly strong. Thus, Wilson, the naturalist, observed at one place, thirty miles from the mouth of the Kentucky river, great numbers of parrots. About an hour after sunrise they came screaming through the woods, to drink the salt water, of which they are remarkably fond. When they alighted on the ground

it appeared, at a distance, as if it were covered with a carpet of the richest green, orange, and yellow. They afterwards settled on a neighbouring tree, which stood by itself: they covered almost every twig of it, and the bright beams of the sun, shining strongly on their gay and glossy plumage, presented a very beautiful and splendid appearance. The mind revolts as it thinks of a gun discharged in such circumstances; but this being done, and a number of the parrots shot, some of which were only wounded, the rest swept repeatedly round their prostrate companions, and again settled on a low tree at a short distance. At each successive discharge, though showers of them fell, yet the affection of the survivors appeared to increase, for after a few circuits round the place, they again alighted, and looked down on their slaughtered companions, in a manner that clearly showed their sympathy and concern.

One parrot, called Poll by Wilson, was carried by him upwards of a thousand miles in his pocket, but regularly liberated at meal-times and in the evening, to its great satisfaction. On arriving at the house of a friend he procured a cage, and placed it under the piazza, where, by its call, it soon attracted the passing flocks: such is the attachment they have for each other.

Numerous parties frequently alighted in the trees above, keeping up a constant conversation with the prisoner. One of these was wounded slightly in the wing; and the pleasure expressed by Poll on meeting with this new companion was really amusing. She crept close up to it as it hung on the side of the cage, chattering to it in a low tone of voice, as if sympathizing in its misfortune, scratched about its head and neck with her bill; and both at night nestled as close as possible to each other, sometimes the head of Poll being thrust through the plumage of its companion. On the death of her friend she appeared restless and inconsolable for several days.

The building of nests may be taken as affording another instance of the instinct of birds. Without, however, describing the usual process, it may be remarked, that the mode pursued by these little artificers is not always the same; on the contrary, it varies so as to suit new and peculiar circumstances. In our own island, the nests of each particular species, when built in the open country, are always essentially alike; yet when reared near towns and villages, where the same materials are not to be obtained, their form is adapted to their situation, and to the substance of which they are constructed.

The engraving represents one recently brought from Africa, and well deserves attention. It is composed of



An African Nest.

the down of plants, felted as it were, so as to form a tolerably compact, though soft and delicate fabric,

having a narrow entrance near the upper portion of the dome. This nest is generally placed among the twigs of thorny shrubs, but sometimes at the extremity of the branches of trees. This nest is usually of great comparative size; but though different specimens vary in this respect, yet, however large they may be, it is only in external volume, the walls being very thick, while the inner cavity of the largest does not exceed that of the smallest. Abundance or deficiency of material may tend to cause this difference, which varies from five, six, or eight inches to a foot in outward measurement, or even more, while the diameter of the cavity within is about three inches. Its colour varies with the raw material of which it is made; often it is of snowy whiteness, at other times it is of a brownish hue.

Its outer form, though globular as a whole, is irregular, according to the direction of the branches on which it rests, and to which it is so intimately attached that it is impossible to move it without tearing the substance, and leaving flakes and shreds of it still adhering. The twigs, indeed, pass through its walls, and are firmly embraced by the felted mass of down. Irregularity, however, only prevails without. If the finger be passed into it, surprise will be felt that a little bird, with no instrument except its beak, wings, and legs, should

succeed so far as to render the lining of down as united and smooth as cloth of delicate texture.

The entrance to the nest is a narrow circular opening, through a short neck projecting from some part near the upper portion of the dome, as convenience or the situation of the nest may determine. At the base of the neck, there may be observed in the engraving, a little recess, which is intended to receive the end of the neck when pressed together by the wings or beak of the birds, so that the entrance to the nest may be completely concealed. The specimen now lying before the writer, in which, from the softness of the material, a few touches will do all that is required to close the nest, affords a most interesting illustration of the sagacity of birds. The artificer of this nest is the pincpine, a bird resembling, in its habits and manners, our own wren, and in some respects those of the lark.

Objects of interest may be discovered wherever in our rambles we can trace the haunts of birds, and there observe

Their exquisitely woven nests ; where lie
Their callow offspring, quiet as the down
On their own breasts, till from her search the dam,
With laden bill, returns, and shares the meal
Among her clamorous suppliants, all agape ;
Then, cowering o'er them with expanded wings,
She feels how sweet it is to be a mother.

It is, indeed, as parents that birds display their strongest feelings. The hen, timid in other circumstances, appears with a new spirit when surrounded by her brood, and is ready to defend them from every foe at the peril of her life. The missel-thrush, during the breeding season, will fight even the jay or the magpie. A bird not much larger than a swallow has been known to attack a hawk. A pair of ravens, which dwelt in a cavity of the rock of Gibraltar, would never suffer a vulture or eagle to approach the nest, but drove it away with every appearance of fury. Similar strength of feeling is manifested in different circumstances. One instance of this is given us by White, of Selborne. The common fly-catcher was accustomed to build every year in the vines that grew on the walls of his house; and one year a pair inadvertently placed their nest on a naked bough. They did so, perhaps, when the season was shady, and they could not anticipate the inconvenience that followed. Hot sunny weather, however, coming on before the brood was half-fledged, the reflection of the wall would have destroyed the brood had not the parent birds averted the evil, by hovering over the nest all the hotter hours, while, with wings expanded, and mouths gaping for breath, they screened the heat from their suffering offspring.

In other instances artifice is manifest :—

Hence, around the head
Of wandering swain the white-winged plover wheels
Her sounding flight, and then directly on
In long excursion skims the level lawn,
To tempt him from her nest : the wild duck, hence,
O'er the rough moss ; and o'er the trackless waste
The heath-hen flutters, all intent to lead
The hot-pursuing spaniel far astray.

Nor is the display of other feelings wanting :—

The nightingale,
When returning with her loaded bill,
The astonished mother finds a vacant nest,
By the hard hands of unrelenting clowns
Robb'd ; to the ground the vain provision falls !
Her pinions ruffle, and low drooping, scarce
Can bear the mourner to the poplar shade ;
Where, all abandoned to despair, she sings
Her sorrows through the night ; and in the bough
Sole sitting, still at every dying fall
Takes up again her lamentable strain
Of winding woe ; till wide around the woods
Sigh to her song, and with her wail resound.

It is worthy of remark, that where a nest is not built, and where the tenderness discoverable in connexion with such a dwelling is not manifest, there is no want of provision for the bird or its young. The cuckoo of Europe, for example, does not lay its eggs in other birds' nests indiscriminately, but chooses only those of soft-billed, insect-eating birds, to which it can

entrust the proper feeding of its progeny. And North American cuckoos display an equal sagacity in selecting the nests of the cowpen birds. The burrowing owls, found in some parts of the United States, reside exclusively in the villages of the marmot, or prairie dog. The excavations made by this creature are so commodious as to render it unnecessary that the bird should dig for itself, as it is said to do in other parts of the world, where no burrowing animals exist.

In some cases no information is possessed as to the nest of the bird; of which the satin bower-bird of Australia may be cited as an example. The indefatigable naturalist, Mr. Gould, used his utmost endeavours, but could never discover the nest and eggs of this species; nor could he obtain any authentic information from the natives or the colonists, a proof of the artifice employed in its concealment. Still, a remarkable display of instinct is apparent. This bird constructs, on the ground, a bower or arbour, which is not used as a nest, but as a playing ground, or hall of assembly, and which it decorates with beautiful feathers. This fabric is usually placed under the shelter of the branches of some overhanging tree, in the most retired part of the forest; the size and the quantity of materials used differing in different circumstances.

The structure of these bowers is as follows. An extensive, and rather convex floor or base is laid, com-



The Satin Bower-Bird.

posed of sticks firmly interwoven together, and about the centre the bower is built, in the form of two parallel walls, at a little distance apart. These consist of

slender, flexible twigs and stems, so arranged as to curve inwards, and nearly meet at the top, forming an avenue arched over head. The twigs are so placed that the forks and projections are always outwards, the interior being free from any obstruction to the passage of the birds through the avenue. The bower is decorated at and near the entrance with the most gaily-coloured articles that can be collected, such as the feathers of parrots. Some of these are stuck in among the twigs, while others, with bleached bones and shells, are strewed about near the entrance.

What is the precise object of this bower it is not easy to determine. There are numerous points in the habits and economy of animals the design of which we cannot penetrate. As, however, God delights in his works, and provides for the happiness of his creatures, according to their capability of enjoyment, it may be that these bowers are instinctively arranged, with no farther object than to afford pleasure. Certainly they are not used as nests, but as places of resort for many individuals of both sexes, which, when there assembled, run through and round the bower in a sportive and playful manner; and that so constantly, that it is seldom entirely deserted, at least, during the spring and summer.

The spotted bower-bird constructs an arched avenue of twigs, often exceeding three feet in the length of the



The Spotted Bower-Bird.

run ; grasses tall and smooth are used for it as a lining, and the ornaments consist of pebbles, bleached shells, and bones whitened by exposure to the sun and air.

CHAPTER II.

ILLUSTRATION OF INSTINCT CONTINUED — SENSE OF DANGER —
PURSUIT OF FOOD — INCUBATION — MIGRATION — POWER OF IMI-
TATION — WHAT IS INSTINCT? — THE HUMAN SOUL.

AMONG the displays of instinct on which we are now dwelling, may be noticed that sense of coming peril which has been afforded by a wise and beneficent Providence. Had birds escaped some particular danger, they would naturally avoid it, as some do the gun of the sportsman ; but they are found actually to shun it, in cases where they have had no intimation of its approach. As soon, for instance, as a young duck has escaped from the shell, it will swim in a pond and catch gnats and flies, but it will avoid a wasp, the sting of which would prove injurious, if not fatal. Young chickens, too, will show no fear at the sight of a goose or a turkey, but if a hawk hovers at a distance in the air, they will promptly seek the defence of their mother's wing. Rooks, while providing for their offspring, generally cater apart, but after the breeding season, like some

other birds, they have sentinels while feeding in parties. So vigilant are these sentinels, that there is some difficulty in getting within shot of a foraging party, and hence it has been supposed that rooks smell gunpowder. A walking-stick, if levelled at them, will, however, produce equal alarm. Another curious fact may be mentioned, in reference to a bird which visits us in summer, and is known by its cry of "Crake, crake." The corn-crake, as it is called, has the power, in common with some other creatures, of feigning death. A dog having brought one to a gentleman, which was dead to all appearance, he turned it over with his foot as it lay on the ground. He was convinced it was so, but standing by in silence for some time, he suddenly saw the corncrake open an eye ; he then took it up, but its head fell, its legs hung loose, it appeared, as before, totally dead. He then put it into his pocket, but there he soon felt it to be alive and struggling to escape ; he took it out, and it appeared lifeless as before. He soon laid it on the ground, and stood at some distance ; in a few minutes it carefully raised its head, looked round, and started off at full speed.

A series of interesting facts might be selected, showing the expedients adopted by instinct in procuring food ; we can, however, only mention one or two. Mr.

Pringle, an interesting traveller and poet, speaks of the country of the Caffer,

Where laughing maids at sunset roam,
To bear the juicy melons home ;
And striplings from Kalumna's wood
Bring wild grapes and the pigeon's brood,
With fragrant hoard of honey-bee
Rifled from the hollow tree.

The manner in which the spoil is obtained is not a little remarkable. In some parts of Africa wild honey is found in abundance, and the natives in searching for it frequently avail themselves of the singular instinct of the bee-cuckoo, or honey-bird. This bird, somewhat larger than the common sparrow, is well known in that country for its extraordinary power of discovering the hives or nests of the wild bees, which are there constructed in hollow trees, in crevices of the rocks, or in holes in the ground. The bird being extremely fond of honey, and at the same time unable, without assistance, to gain access to the hives, is supplied with the means of calling to its aid certain other animals, and especially of man, to enable it to secure its object.

It usually sits on a tree by the way-side, and when any passenger approaches greets him with its peculiar cry of cherr-a-cheer! cherr-a-cherr! If he shows any disposition to attend to its call, it goes before him in

short flights from tree to tree, till it conducts him to a spot where it knows a bee-hive to be concealed. It then sits still and silent till he has extracted the honey-comb, of which it expects a portion as its share of the spoil; and this share, the natives who profit by its guidance, never fail to leave it.

It is stated, that the ratel, or honey-badger, avails itself of the help of this bird to discover the retreat of those bees that build their nest in the ground, and shares with it the plunder of these abodes. It is also asserted, that the honey-bird sometimes calls to its aid the woodpecker, a bird which finds in the caterpillar or the young bees a treat as enticing to its taste as the honey is to that of its ingenious associate.

The habits of the fish-hawk are very peculiar. It subsists on the finny tribes that swarm in bays, creeks, and rivers; it procures its prey by its own active skill and industry, and appears dependent on the land only as a resting-place, or, in the usual season, as a spot for its nest, eggs, and young. On the arrival of these birds in the northern part of the United States in the month of March, they sometimes find the bays and ponds frozen, and experience a difficulty for many days in procuring fish; yet there is no instance on record of their attacking birds or inferior land-animals to

supply the deficiency, though from their strength it would seem they could do this with ease. As soon as they arrive, however, they wage war on the bald eagles, as if these were a herd of robbers, sometimes by their numbers and perseverance driving them from their haunts, but seldom or never attacking them in single combat.

In the pursuit of food the fish-hawk, leaving the nest, usually flies direct until he comes to the sea, and then sails round in easy curving lines, turning sometimes in the air as on a pivot, apparently without the least exertion, rarely moving his wings, and with his legs extended in a straight line behind. The height at which he thus glides varies from one hundred to two hundred feet: sometimes he ascends much higher, but all the while he calmly reconnoitres the face of the deep. Suddenly he is seen to check his course, as if struck by a particular object, and so intently does he survey it for a few moments that he appears flapping his wing and fixed in air. It was a fish on which his eye was fastened, but it has disappeared, and he is seen sailing round as before. Again his attention is caught, and he descends with great rapidity, but before he reaches the surface shoots off on another course, as if ashamed he had been foiled a second time. He now flies at a

short distance above the surface, and then, by a zigzag descent, and without seeming to dip his feet in the water, seizes a fish, which, after carrying a short distance, he perhaps drops, or yields up to the bald eagle, and again ascends by easy spiral circles to the higher regions of the air, where he glides hither and thither with all the ease, elegance, and majesty of his species. From this aerial height he now suddenly descends like a perpendicular torrent, and plunges into the sea with a loud rushing sound. In a few moments he emerges, bearing in his claws the struggling prey, which he always carries head foremost, and having risen a few feet above the surface, shakes himself like a water-spaniel, and directs his heavy and laborious course straight to the land. Should the wind blow hard, and his nest lie in the quarter from whence it comes, he beats to windward with judgment and energy, not in a direct line, but by making several successive tacks to gain his purpose.

Remarkable as his flight appears, it becomes more so if the size of the fish which he sometimes bears along be considered. A shad was taken from a fish-hawk, and though he had eaten a considerable portion of it, the remainder weighed six pounds. Other instances are mentioned in which a large booty was secured. It

is singular that the hawk never descends to pick up a fish which he happens to drop, either on the land or the water. Sometimes when fishing he mistakes his mark, or over-rates his strength, by striking a fish too large and powerful for him to manage; in this case he is dragged under the water, and though he sometimes succeeds in extricating himself, after being taken three or four times down, yet oftener both parties perish in the struggle. The body of a sturgeon, or of some other large fish, with a hawk fast grappled in it, has, at different times, been found dead on the shore, cast up by the waves.

Another instance of the power of instinct may be derived from the process of incubation; and, for the sake of variety, the brush-turkey of Australia may be noticed, whose habits in this respect are very peculiar. This bird collects together an immense heap of decaying vegetable matter, as a depository for the eggs, and trusts to the heat engendered by decomposition, for the development of the young. The heap employed for this purpose is collected by the birds during several weeks previous to the period of laying: it varies in size from two to four cart loads, and is in the form of a perfect pyramid. The construction of this mound is not the work of one pair of birds, but of the united

labours of several. The same site appears to be resorted to for several years in succession, the birds adding a fresh supply of materials previously to laying. In every instance in which Mr. Gould saw these mounds, they were placed in the most retired and shady glens, and on the slope of a hill. The ground above was always scratched clean, while that below appeared to be untouched, as if the birds had found it more convenient to bring the materials down the hill than to throw them up.

The mode in which the materials are accumulated is equally singular; the bird never using its beak, but always grasping a quantity in its foot, throwing it backwards to one common centre; and thus clearing the surface of the ground for a considerable distance so completely, that scarcely a leaf or a blade of grass is left. The heap being accumulated, and the time allowed for sufficient heat to be engendered, the eggs are deposited, not side by side, but at the distance of nine or twelve inches from each other, and buried at nearly an arm's depth, perfectly upright, with the large end upwards. They are covered up as they are laid, and allowed to remain until hatched. It is not unusual for natives and settlers living far from their haunts, to obtain nearly a bushel of eggs at one time from a

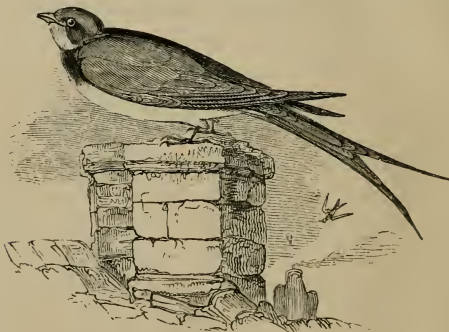
single heap; and as they are delicious eating, they are eagerly sought after.

The migration of birds is too remarkable to escape the glimpse we are taking at the sagacity of the feathered tribes. As it regards our island, their course is both northwards and southwards; in other words, there are a periodical ebb and tide of spring and winter visitors. How fully adapted is this fact to lead the mind to that Almighty Power, which, impelling the birds of the air from zone to zone,

Guides through the boundless sky their certain flight!

No sooner do the daisy, the cowslip, and the violet adorn our meadows, than a multitude of them appear, as if they had just sprung into existence. With the advance of the season, they have gradually worked their way from the regions of the south, where, during our winter of frost and cold they have enjoyed food and warmth. But they are still our birds, for here they build their nests, and rear their young, and return, many at least, year after year, to their old and well-tried haunts. Our summer birds of passage live on that kind of food which they find it impossible to procure during the severities of winter; in addition to which they are incapable of sustaining a low degree of temperature, and

hence they seek not only a region where their wants may be supplied, but a genial climate. Their visit to our shores depends, however, on the weather, which appears to hasten or retard their progress. It often occurs, that a few, taking advantage of a favourable opportunity, arrive some days before the main body, which is detained by a sudden return of bad weather:

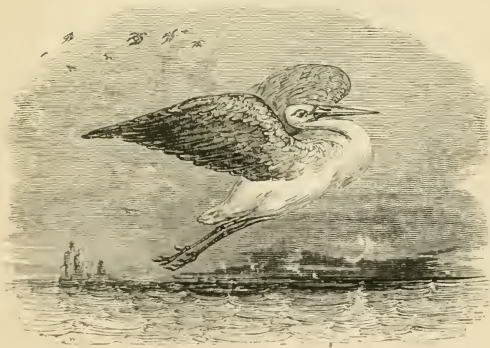


The Swallow.

thus verifying the adage, "One swallow does not make a summer." One singular fact connected with the arrival of our welcome visitors is this—the males appear in our woodlands several days, sometimes a week or two, before the females join them. It would seem as if they came to look out for a fit spot, a deep glen, or hawthorn

hedge, to which to invite their expected mates, for their notes of call are heard in all directions.

Truly "the stork in the heaven knoweth her appointed times." The north of Africa, and especially Egypt, are the places of its winter sojourn, for there are a genial temperature and abundant food. In the month of March, or the beginning of April, this bird arrives in small bands, or flocks, in Holland, where it univer-



The Stork.

sally meets with a kind and hospitable reception. It returns year after year to the same town, and the same chimney-top; it re-occupies its deserted nest; and the

gladness with which storks again take possession of their dwelling, and the attachment they manifest towards their benevolent hosts, have often been mentioned.

Is it asked, Whither do all our summer visitors retire on leaving the temperate latitudes of Europe? It may be replied, that all follow the mighty stream southwards: some stop short on the confines of Europe; some penetrate into the adjacent parts of Asia; but, more probably, find in Africa, ever teeming with insect tribes, all they require. Other birds there are, natives of the region of the arctic circle—dwellers among morasses and forests, which afford, during summer, an abundance of food, and every advantage in rearing their young. Winter sets in early there; and when it begins to freeze the lakes, and harden the surface of the earth, they depart southwards, arriving in our latitudes as our summer birds are departing. They do not, however, fill their place, for theirs is not the voice of song; or, if in some instance it should be, the voice is mute, food only being the object of their visit. But if our winter guests are not prized for their melody, many are as luxuries for the table, of which the snipe, the woodcock, and the fieldfare may be cited as examples.

To allude to only one more instance of instinctive power, reference may be made to the capacity for imi-

tation with which all birds, to some extent, and others to a very remarkable degree, are gifted. Montgomery has described some of the movements of the pelicans :—

On heetling rocks the little ones were marshalled ;
There by endearments, stripes, example, urged
To try the void convexity of heaven,
And plough the ocean's horizontal field.
Timorous, at first they fluttered round the verge,
Balanced and furled their hesitating wings,
Then put them forth again with steadier aim ;
Now, gaining courage as they felt the wind
Dilate their feathers, fill their airy frames
With buoyancy that bore them from their feet,
They yielded all their burthen to the breeze,
And sailed and soared where'er their guardians led
Ascending, hovering, wheeling, or alighting,
They searched the deep in quest of nobler game
Than yet their inexperience had encountered :
With these they battled in that element,
Where wings or fins were equally at home,
Till, conquerors in many a desperate strife,
They dragged their spoils to land, and gorged at leisure.

Many caged birds, when young, will readily learn the notes of birds in the same room. One is mentioned, which from hearing the call of the sparrows out of doors, acquired it perfectly ; he also learned many of the notes of a blackcap, which was hanging near ; and, afterwards, attempted some of the notes of a robin, whose cage hung under his. At the same time, he could utter the call-note of his own species. In some

instances the power of imitation is truly extraordinary, until we reach the mocking-bird, which Southey calls—

That cheerful one, who knoweth all
The songs of all the winged choristers ;
And, in one sequence of melodious sounds,
Pours all their music.

The ability of parrots to speak, and to increase their stock of words and phrases, is a fact with which all are familiar, and on which no space is left to expatiate.

Having now accomplished the design proposed in offering some illustration of the sagacity of birds, the question may, perhaps, be proposed, What is instinct? To this it may be replied, that what it is in itself we cannot ascertain. It is enough for us to know, that instinct is a gift of the all-wise Creator to the feathered tribes, in common with other creatures, preparing them, not only for the ordinary, but for peculiar circumstances allotted to them in his Providence.

If instinct, in certain respects, resembles the minds with which we are endowed; there are others in which a contrariety is clearly apparent. Instinct may be improved by skilful training up to a certain point, but beyond this it is impossible to proceed. The circle in which it moves is, and must be, extremely small. The human mind, on the contrary, has a marvellous

capacity for progression. Placed in circumstances, favourable to its development, it expands from the days of infancy to those of age, and even then, we know nothing of its decline, but only of the decay of the instruments which it employs in its service.

Unlike the instinct of inferior creatures, the mind—the soul, is immortal, and prepared, therefore, for a constant advancement in the world of blessedness, or for inconceivable degradation and wretchedness in the world of woe. Let every reader, then, propose the solemn inquiry, To which state am I going? Am I in the path which will lead to the presence of God and the Lamb, to the innumerable company of angels, and to the society of the redeemed, or, am I on the road which conducts to the prison of impenitent and condemned spirits?

With what seriousness should we attend to the words of the adorable Redeemer: “The Father loveth the Son, and hath given all things into his hand! He that believeth on the Son hath everlasting life: and he that believeth not the Son shall not see life; but the wrath of God abideth on him,” John iii. 35, 36. It is, therefore, that crediting of the testimony of God which leads the soul to renounce all hope of saving itself, and to repose its whole trust on our Lord Jesus Christ, that issues in salvation.

It is by this faith that we obey the charge to “look” to him—that we accept his invitation to “come to him”—that we are said to “eat his flesh, and to drink his blood.” Without faith we can no more be saved, than we could have been if the Son of God had remained in the bosom of the Father, and left a world of transgressors to perish.

Should any one who reads this page be convinced by the dictates of eternal truth that he is still in a state of unbelief, the gospel of the grace of God demands his immediate reception ; it presents before him that message of compassion which it behoves him to embrace, and it points to that throne of mercy from whence all he needs may be obtained. Oh that without delay he may exercise that faith which is the gift of God, which works by love, purifies the heart, and overcomes the world !

THE END.

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